

INSIDE: HOW FWP IS TACKLING AN UPTICK IN WILDLIFE DISEASE

Montana Outdoors

MONTANA FISH, WILDLIFE & PARKS | \$4.50

SEPTEMBER-OCTOBER 2025

OUTSMARTING Missoula's Hungry Bears

IN THIS ISSUE:

CLIMBING HIGH FOR DUSKIES

A WORLD RECORD UNDERWATER TIGER

HOW MONTANA BECAME AN UPLAND IMPORT EMPIRE

Montana Outdoors

SEPTEMBER-OCTOBER 2025

FEATURES

12 Get Smart Simply by taking out the trash, Missoula became North America's largest Bear Smart Community, inspiring other towns to follow suit. *By Paul Queneau*

20 Upland Imports Transplanted from other states or other continents, Montana's introduced upland bird species are now a welcome presence for many hunters. Here's how they arrived and where to find them.

By Jack Ballard

26 Interconnected More and more wildlife diseases are being detected in Montana. Keeping tabs on them helps protect domestic animals and people, too. *By Julie Lue*

34 Ravenous Record-Setters Montana is home to some of the world's largest tiger muskies, a voracious muskellunge-northern pike hybrid attracting anglers from across the United States. *By E. Donnell Thomas, Jr.*

40 Climbing for Dusky Grouse A reflection on how shifting seasons, wild places, and memories converge on a September mountainside. *By Noah Davis*



Montana Outdoors

FIRST PLACE MAGAZINE:
2005, 2006, 2008, 2011, 2017,
2018, 2021, 2022
Association for
Conservation Information

MONTANA OUTDOORS
VOLUME 56, NUMBER 5

STATE OF MONTANA
Greg Gianforte, Governor

**MONTANA FISH,
WILDLIFE & PARKS**
Christy Clark, Director

MONTANA OUTDOORS STAFF
Paul Queneau, Editor
Amanda Reese, Art Director
Angie Howell, Circulation Manager

**MONTANA FISH AND
WILDLIFE COMMISSION**

Lesley Robinson, Chair
Jeff Burrows | K.C. Walsh
Susan Brooke | Brian Cebull
Ian Wargo | William Lane

**MONTANA STATE PARKS
AND RECREATION BOARD**

Liz Whiting, Chair
Jody Loomis
Russ Kipp
Kathy McLane
John Marancik

Montana Outdoors (ISSN 0027-0016) is published bimonthly by Montana Fish, Wildlife & Parks in partnership with our subscribers. Subscription rates are \$15 for one year, \$25 for two years, and \$30 for three years. (Please add \$3 per year for Canadian subscriptions. All other foreign subscriptions, airmail only, are \$50 for one year.) Individual copies and back issues cost \$5.50 each (includes postage). Although *Montana Outdoors* is copyrighted, permission to reprint articles is available by writing our office or phoning us at (406) 495-3257. All correspondence should be addressed to: *Montana Outdoors*, Montana Fish, Wildlife & Parks, 930 West Custer Avenue, P.O. Box 200701, Helena, MT 59620-0701. Website: fwp.mt.gov/montana-outdoors. Email: montanaoutdoors@mt.gov. ©2025, Montana Fish, Wildlife & Parks. All rights reserved.

For address changes or subscription information call
800-678-6668. In Canada call **+1406-495-3257**

Postmaster: Send address changes to *Montana Outdoors*, Montana Fish, Wildlife & Parks, P.O. Box 200701, Helena, MT 59620-0701. Preferred periodicals postage paid at Helena, MT 59601, and additional mailing offices.





RING FLASH Revered by hunters for their speed, smarts, and colorful grace, ring-necked pheasants are a star attraction among upland birds imported to Montana. Read more about them and their brethren on page 20. Photo by Dick Walker.

COVER Black bears are most likely to cause problems if they get hooked on human food and garbage. Read about a movement to get smarter about bear attractants on page 12. Photo by Donald M. Jones.

DEPARTMENTS

- 2 LETTERS**
- 2 PAST PERSPECTIVES**
- 3 TASTING MONTANA**
- 4 OUR POINT OF VIEW**
- 5 FWP AT WORK**

- 6 SNAPSHOT**
- 8 FIELD WORK**
- 10 OUTDOORS REPORT**
- 44 SKETCHBOOK**
- 45 OUTDOORS PORTRAIT**



Snakes and snakebites

My friends and I who visit your state to hunt upland birds each fall enjoyed Don Thomas's "Snakebite" article (July-August). Mr. Thomas's article notes that prairie rattlers are "found statewide except in high mountain areas," but we never expected to find one right in downtown Livingston. Yet that's where my Lab was when she was bitten on her left cheek

in late October of 2023 while doing her morning business—right outside our motel room. I'd also like to recommend to your readers to train their dogs to retreat from any snake. Yes, do use a credible avoidance trainer if you can find one, but you can also use negative reinforcement with any freshly killed or live non-poisonous snake you come across to train your dog to always avoid any snake it sees or smells.

Also, when in a snake area, watch your dog for any signs it has located something strange. If so, call it to you at once, then move away from that area.

G. Stratford Donnell, Jr.
Louisburg, North Carolina

I am 83 and live on a ranch. I screamed and nearly fainted after pulling the July-August issue out of the mailbox and seeing the rattlesnake on the cover. It was a very poor choice for the front of the magazine.

Myrna Tooke
Ekalaka

Editor replies: Sorry we gave you a start, Myrna! We'll do our best to keep the scare factor in check with future covers. Thanks for the feedback.

Wolf legislation lessons

In the Our Point of View column in *Montana Outdoors* (July-August 2025), FWP director

Christy Clark discussed the 2025 Montana Legislature, writing, "it was clear from the number of bills focused on wolves that Montanans are concerned that this predator's numbers are too high." I disagree. The fact that the three bills promoting increased wolf killing were defeated (HB 176, HB 222, HB 258), coupled with considerable public opposition to them, does not support the director's statement. What Montanans are really concerned about is the political rather than scientific management of wildlife, especially wolves and other predators.

Noreen Breeding
Bozeman

We welcome all your comments, questions, and letters to the editor. We edit letters to meet our needs for accuracy, style, and length. Write to us at Montana Outdoors, P.O. Box 200701, Helena, MT 59620-0701 or email us at: paul.queneau@mt.gov.

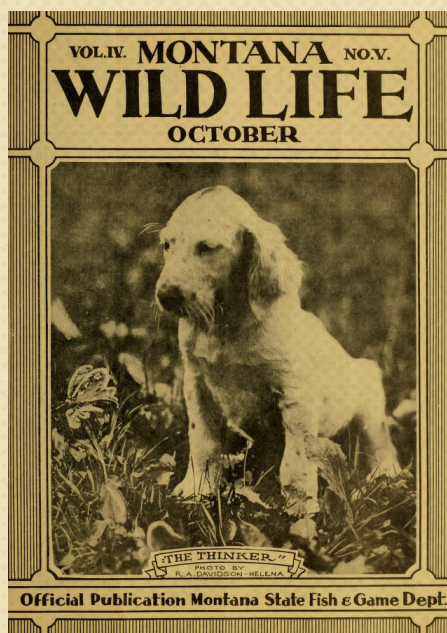
PAST PERSPECTIVES

Excerpts from the FWP archive

FWP has been issuing safety warnings to hunters for almost a century. In the October 1931 issue of *Montana Wild Life*, editor Floyd L. Smith offered these recommendations under the heading "Hunters Urged to Sport Togs of Bright Hue."

"With hunting seasons approaching, game officials are issuing the warning that hunters are often in as great danger as the game they hunt," Smith wrote. "Last season several states reported a record toll of deaths and injuries among hunters due to an increasing number of amateurs in the ranks and the sometimes-crowded condition of huntable areas, especially on holidays."

Smith continued with warnings that safety experts still offer today: "Hunters are being advised to handle their guns with great care, to hold their fire until they are positive they see what they think they see, to steer clear of the amateurish trick



of shooting at moving brush, and to dress distinctively in hunting togs of bright color, preferably red or white."

It took another 60 years and dozens of accidental deaths before Montana legislators made it mandatory for hunters to wear at least 400 square inches of visible blaze orange.

Finally, Smith noted that during the previous hunting season several hunters died of starvation and exposure after being lost. "The first and most important thing for a person to remember when he believes himself lost is to stop where he is, compose himself, and calmly try to orient himself, and then try to find his way out," he wrote. "If not confident of his ability to find his way out, he should build a fire and arrange himself as comfortably as possible, discharge his gun at intervals, and wait for friends to come to his rescue." ■

Governor Gianforte's Montana Moo Shu Duck

By Gov. Greg Gianforte | Preparation time: 15 minutes | Cooking time: 4-5 hours | Serves 6



PHOTO COURTESY GREG GIANFORTE

Montana's wild landscapes fuel my passion for duck hunting, a tradition I cherish each season. I generally get out two or three times, often jump-shooting mallards along Bozeman's East Gallatin River or hunting at a friend's ranch brimming with ducks.

When I'm in a blind, a talented Labrador retrieves for me, but I'm just as happy wading in myself to fetch a downed bird. The blind is more than a tool for hunting—it's a sanctuary of camaraderie. I love the time spent with friends and family trading stories, perfecting our duck calls, and watching flocks commit to our decoys under Montana's vast sky.

Mallards are my favorite duck to cook and share. My go-to dish, Montana Moo Shu Duck, transforms the hunt into a meal. I combine mallard breasts, hoisin sauce, and a nice dark beer such as Big Sky Brewing's Moose Drool, in a slow cooker set to low. Once it's good and tender, I shred the meat with some plum sauce, wrap it in warm flour tortillas, garnish with sliced scallions, and serve.

Bursting with flavor, this dish celebrates Montana's proud outdoor heritage and the joy of sharing good food with great company. ■



Montana Governor Greg Gianforte with enough mallards from a successful hunt to make a nice meal to share with friends and family.

INGREDIENTS

6 mallard breasts, skinned and deboned
8 oz. jar hoisin sauce
1 can Moose Drool or other dark beer
2 rounded T. plum sauce
2-3 scallions, chopped
12 flour tortillas

DIRECTIONS

Place duck breasts in slow cooker on low with hoisin sauce and beer. Cook 4 to 5 hours. Move meat to bowl and shred with forks. Add remaining sauce from slow cooker to a bowl along with plum sauce, then mix. Serve in warmed tortillas along with thin-sliced scallions.



Montana's Tastiest Ducks

Many waterfowlers would agree that the premier species for table fare are teal: blue-winged, cinnamon, or, especially, green-winged. Also gaining high marks for taste are pintails and canvasback (a diver species that feeds on wild celery and sago pondweed). And many hunters favor late-season mallards, known as "northerns" or, for their thick yellow layer of delicious breast and thigh fat—"butterballs."

Among the ducks considered less palatable are shovelers and goldeneyes. "Spoones" consume vegetation and invertebrates from lake bottoms, giving the meat a muddy taste, while "whistlers" eat minnows and aquatic invertebrates that can impart a fishy flavor. Yet both species are edible when used in a gumbo or curry. ■

—Tom Dickson

Find more
recipes online at
bit.ly/TastingMontana



An evolution in grizzly management

Years ago, my kids and I biked along a county road to a spot we love just outside Choteau along the Teton River a half-mile from our house. While they stacked rocks and had sword fights with sticks, I strolled back up to the gravel access road to take in the view.

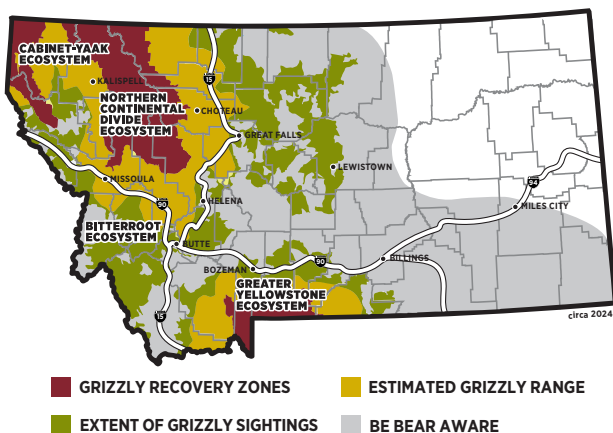
Looking upstream, I spotted a grizzly bear in the distance walking our direction. I hustled back to my kids and said, “Grab your bikes, it’s time to go!” We made it home quickly and without incident, but I was curious about where the bear was headed, so I hopped in our truck and went back. I found the grizzly in the exact place where my kids had just been playing. It was chilling to imagine what could have happened if we’d surprised that bear up close rather than spotting it from a distance.

Back home, I called FWP’s local bear management specialist, who thanked me for reporting the sighting.

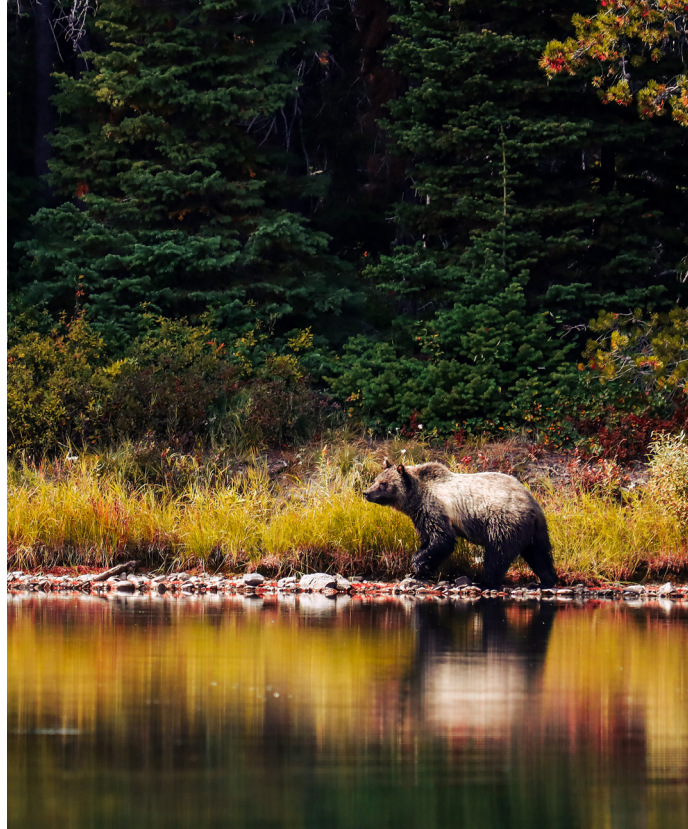
That memory is one reason I take personal pride in FWP’s new Grizzly Bear Conflict Dashboard, which debuted this summer along with a Bear Relocation Dashboard. Combined with the Grizzly Bear Mortality Dashboard, these tools add transparency to FWP’s bear management and allow Montana residents and visitors to track bear-related incidents across the state.

That’s especially important in places like Choteau where my grandkids are now the seventh generation of our family to be raised. It was once rare to see a bear in this area, but FWP biologists counted 12 grizzlies in and around Choteau this spring, including three females with cubs. My grandkids usually ride their bikes to school, but not this past spring with that many bears around.

Don’t get me wrong. Like most Montanans, I’m thrilled to spot a grizzly in the wild and from a safe distance. But when you find one in your backyard right in town, it’s a whole different matter.



As this map illustrates, grizzlies now roam a broad swath of Montana. To track bear incidents, visit FWP’s interactive grizzly dashboards at fwp.mt.gov/conservation/wildlife-management/grizzly-bears SOURCE FWP



Choteau was once on the fringes of the occupied range of grizzlies in the Northern Continental Divide Ecosystem (NCDE), which contains Glacier National Park and the Bob Marshall Wilderness complex. That range now extends east out onto the prairie well beyond Choteau and even past Great Falls.

This comes as a result of an awe-inspiring recovery made possible by the Endangered Species Act. When grizzlies gained ESA protections in 1975, fewer than 200 bears roamed the NCDE. Today it hosts at least 1,200. In the Greater Yellowstone Ecosystem (GYE), they’ve risen from around 136 bears a half century ago to more than 1,100 today. FWP played a key role every step of the way through its management and research efforts, as did Montana’s citizens, whose patience was vital to the success of the ESA restrictions.

This year marks the 50th anniversary of the grizzly bear’s ESA listing in the Lower 48. It’s possible that by the time you read this, the U.S. Fish & Wildlife Service (USFWS) will have moved to delist bears in the GYE and NCDE, handing management off to Montana, Idaho, and Wyoming. This is the next logical chapter in an incredible story of wildlife restoration. Bear populations exceeded federal recovery goals more than two decades ago, and FWP has been preparing for delisting ever since. In 2022, we released a Statewide Grizzly Bear Management Plan, which, along with laws passed by the 2023 Montana Legislature, will ensure bear populations remain healthy and stable across the state and provide greater flexibility for dealing with problem bears, whether they are killing livestock or getting too close to human settlements.

No matter what the USFWS decides, FWP will continue to engage the public in management while prioritizing human safety. We want a healthy grizzly population in Montana, but we also want children to be able to ride their bikes to school and people to be able to enjoy the outdoors without having to retreat back to their homes like my kids and I did that day.

—Christy Clark, Director, Montana Fish, Wildlife & Parks



LAUREN KARNOPP / FWP

UNDERWATER WARRIOR

STACY SCHMIDT

Aquatic invasive species science supervisor, Helena

MY FAVORITE PART OF MY JOB IS SCUBA DIVING. I started the dive team for FWP's Aquatic Invasive Species Program five years ago, but before that, I was (and still am) a volunteer search and rescue diver. Compared to that intense and often heartbreaking work, swimming around Montana's lakes searching for invasive species is a privilege.

I've loved exploring underwater since I was a kid. Water was scarce on my parents' dryland farm north of Great Falls, but my grandfather had a cabin in Craig so we spent a lot of time on Holter Reservoir and the Missouri River. Every chance I got, I stuck my face below the surface to see what was living underneath. I was fascinated by the ocean, too, but had never seen it, so after graduating from Conrad High School I headed for the Washington coast to study marine science at The Evergreen State College.

My roots later brought me back to Montana, where I landed a job with FWP in Helena. But I still had that itch to explore underwater, so I got scuba certified at a local dive shop and began diving all around the state, eventually joining Lewis and Clark County Search and Rescue. I've returned to the ocean a couple times to dive, including one amazing trip to Hawaii with my mother, but now I get to do it in my job with FWP as well.

In 2020, as concern grew about the threats posed by aquatic invasive species, I suggested we form a dive team to investigate new infestations. Now every summer you can find me scuba diving in places like Nilan and Beaver lakes looking for Eurasian watermilfoil or Holland Lake for fragrant waterlily—spots these species were discovered then later eradicated or suppressed. We use every tool we have to find them and do our best to control them, when and if we can. 🐻

On a rainy September morning, Lincoln-based wildlife photographers **Jaime and Lisa Johnson** were in the Missouri River Breaks when they spotted a large bull elk in a foggy cottonwood bottom. “We don’t often see bulls like that, and when we do, it’s typically at last light, so we were surprised and excited at our luck,” Jaime says. “As we began taking photos, the bull bugled a few times, then we noticed some movement behind and realized another massive bull was quietly approaching. They lined up just perfectly for a split second, and this was the shot that resulted. I love the blur of the other bull in the background combined with the dim lighting, the fog, and the splashes of autumn leaves that are so unique to cottonwood galleries. It was just an ethereal moment in time.” ■



MOUNTAINSIDE CHECKUP

After stalking within 30 yards of a small herd of bighorn sheep on the outskirts of Cascade, FWP wildlife biologist Brent Lonner carefully darted this ewe to test for diseases and give it an ear tag and GPS collar to better understand movement patterns. To keep it calm, Lonner blindfolded the ewe before taking samples to test for pathogens linked to disease outbreaks in bighorn sheep. The work is part of a five-year statewide research effort partnering with University of Montana, Montana State University, Montana Wild Sheep Foundation, private landowners, woolgrowers, and others to help guide management of these popular big game animals. To see how biologists research bighorns, scan the QR code at right or visit youtu.be/R9N1CraZ9QQ ■ PHOTO BY NICK DANIELSON / MONTANA FWP





1,15 Miles, respectively, from Montana's most remote state park, Brush Lake, to the North Dakota and Saskatchewan borders.

Predictions for the hunting season

As leaves fade to yellow, storefronts across Montana turn orange, draped with huge "Welcome Hunters" banners. FWP also steps up to help people prepare for the season with its annual Hunting Forecast. This webpage breaks down the state region by region to outline what hunters can expect for deer, elk, and pronghorn. But it's not just focused on big game. The page includes an upland game bird season outlook with trends for grouse, partridge, and pheasant using FWP's spring survey results, weather, and other data.

Check it out at fwp.mt.gov/hunt/seasons/forecasts ■



INVASIVE SPECIES

Brown trout found in Flathead River

In mid-July, FWP announced the unwelcome discovery of non-native brown trout in the Flathead River upstream of Flathead Lake. Agency officials are asking anglers to keep and submit any brown trout caught in that part of the watershed.

This came after FWP received a report in June that a client of a local fishing guide had caught a brown between Teakettle and Pressentine fishing access sites on the Flathead. FWP wardens followed up and learned the guide had killed the fish but did not keep it, precluding FWP from testing the chemistry of the fish's otolith (ear bone structure) to potentially trace its origin. Luckily, the guide took a photo of the trout, which he shared with FWP, allowing fisheries staff to confirm it was indeed a brown.

"That's the only hard evidence we have at this point," FWP fisheries management biologist Kenny Breidinger told the *Flathead Beacon*. "In the early stages of an illegal introduction, it's kind of like looking for a needle in a haystack. The Flathead is a big river, which is why we're really hoping to have anglers help us out."

FWP fisheries biologists are deploying environmental DNA (eDNA) sampling technology aiming to detect any additional presence of brown trout in the Flathead River and tributaries. If brown trout DNA is found, that will

change how those stretches of the river are managed.

Brown trout are golden-brown to yellow-brown, with dark spots often surrounded by lighter halos, and sometimes with red or orange spots. Once they populate a stream, browns out-compete native bull trout and westslope cutthroat trout for resources, and prey on juvenile fish.

FWP strongly urges anglers who catch a brown in the upper Flathead River or its tributaries to kill the fish and keep it to provide to FWP after reporting the catch to the FWP Region 1 office at 406-752-5501. Anglers are asked to provide the fish as well as the location and date of the catch to assist in monitoring efforts.

Moving live fish from one waterbody to another is illegal in Montana. The introduction of non-native fish and other invasive species can have devastating ecological, recreational, and economic impacts. These species disrupt aquatic ecosystems by altering food webs, reducing biodiversity, and threatening native species critical to Montana's fisheries.

"Protecting our native trout populations is a priority," says Mike Hensler, FWP regional fisheries manager for Region 1. "Brown trout pose a threat to native species in the upper Flathead drainage, and we need the public's help to find out if more are present there." ■



A wildlife overpass on the Flathead Indian Reservation.

WILDLIFE AND HIGHWAYS

Montana passes landmark wildlife crossing legislation

The Montana Legislature this spring passed two groundbreaking bills to create the state's (and nation's) first dedicated funding stream for wildlife crossing structures. These roadway structures, usually under- or overpasses, drastically reduce vehicle collisions with deer, elk, bears, and other wildlife.

According to the Montana Department of Transportation, drivers in the Treasure State have a 1-in-53 chance of hitting a deer, elk, or other large mammal each year, the second-highest rate in the nation behind West Virginia. Statewide, 13 percent of reported collisions involve wildlife, more than double the national average.

House Bill 855 creates a Wildlife Highway Crossings and Accommodations Account, which FWP will administer for the design and construction of bridges, tunnels, and other passages across busy roadways. The structures will improve safety for people and animals while maintaining habitat

connectivity (one such project on U.S. Highway 93 north of Missoula decreased collisions by 80 percent). The account will be funded through sales of a new specialty license plate expected to raise around \$100,000 each year. The plate design will be chosen this fall through a public art contest running from mid-July to October.

Another measure, House Bill 932, allocates 20 percent of Montana's marijuana tax revenue to a Habitat Legacy Account. Of that, 5 percent—around \$500,000 annually—is earmarked for wildlife crossings. Together, the two bills provide Montana with both a mechanism to raise funds and a long-term investment strategy for infrastructure.

Federal grants and other funding will still be critical since wildlife structures can cost tens of millions of dollars. Though expensive, the investment saves money in the long run. According to a Nevada Department of Transportation study, the average cost of a single deer collision runs around \$19,000,

while an elk collision can exceed \$73,000 when factoring in insurance claims, medical bills, and road maintenance costs.

To help decide where to put crossing structures, the Montana Wildlife and Transportation Partnership—a collaboration between the Montana Department of Transportation, FWP, and Montanans for Safe Wildlife Passage (a coalition of citizens and conservation organizations)—developed a statewide planning tool and a heat map to identify priority areas for wildlife crossings. This cooperative effort also has an application program for project proposals and is working to build public-private partnerships to help fund design and construction.

"Hunters, wildlife watchers, and drivers looking to stay safe on the highway all benefit from these structures," says Ken McDonald, chief of FWP's Wildlife Division. "They save lives while protecting migration routes and habitat connectivity, and now we have dedicated funding to help get them built." ■





Get Smart

Simply by taking out the trash, Missoula became Montana's largest Bear Smart Community, inspiring other towns to follow suit.

BY PAUL QUENEAU

SLY SPELUNKER

Black bears are a common sight in Missoula's Lower Rattlesnake neighborhood, where this crafty black bear took advantage of a drainage culvert under Interstate 90 as both a through-passage and hideout. This busy corner of the Garden City is notorious for habituated and human-food-conditioned bruins.

PHOTO BY BRIAN POWERS



IN 2023, A BRAZEN THIEF BROKE INTO MORE THAN A DOZEN VEHICLES IN MISSOULA'S RATTLESNAKE NEIGHBORHOOD.

The offender seldom took anything valuable but always left conspicuous evidence, including chunks of upholstery bitten out and claw marks on the dash.

Then an SUV owner caught the culprit in the act.

A black bear had learned to open car doors in search of human food, but this time it had accidentally locked itself inside. Discovering the bear in the vehicle in the early morning hours, the owner attached a garden hose to the door handle to open it from a second-floor balcony, safely releasing the bear. But the SUV's interior was so wrecked it was later declared a total loss.

Jamie Jonkel, FWP bear management specialist in Missoula, trapped that bear shortly afterward. "We had to put it down," he says. "There's not much you can do once an animal is that habituated."

Having grown up in Missoula, Jonkel recalls when a black bear running afoul of people used to be uncommon. But since starting with FWP in 1996, he's seen bear conflicts in the valley mushroom from 15 incidents per year at the turn of the millennium to almost 500 by 2021. Half involved unsecured garbage cans and dumpsters, with the remainder split among bird feeders,

fruit trees, outdoor freezers, pet food, and other attractants.

Then came 2023, which shattered all records with 1,600 bear conflicts. In the surrounding mountains, huckleberries and other fare were limited due to summer drought. But in the lower elevations of the Missoula Valley, chokecherry, hawthorn, serviceberry, and other natural foods were bountiful, resulting in "bearmageddon," as Jonkel describes it. He estimates 200 bears poured into the Missoula Valley, each trying to consume 20,000 calories or so per day in preparation for winter hibernation. Many found it hard to pass up easy meals.

"In the Rattlesnake alone, we had upwards of 40 bears working the garbage can circuit that year," Jonkel says. "It was a circus trying to keep up with all the calls."

Yet as bear conflicts hit a fever pitch, a big change was afoot at Missoula City Hall, one that should vastly decrease the number of human-food-conditioned black bears in coming years. By unanimous vote, both the City of Missoula and Missoula County adopted new requirements for residences to use certified bear-resistant trash containers.

This made Missoula the largest Bear Smart Community in the nation, a distinction 25 years in the making, and a model other western cities, including Bozeman, are looking to emulate.

Paul Queneau is the editor of Montana Outdoors.





MAKING THE ROUNDS A black bear cruises the University of Montana campus searching for unsecured trash and other human handouts.

PHOTO BY ROB G. GREEN

DEMAGNETIZING THE ATTRACTANTS

The Bear Smart Community program was first developed in Canada in the early 2000s, then adapted for the United States by the Interagency Grizzly Bear Committee (IGBC) in 2022.

“It aims to prevent human-bear conflicts before they happen by addressing the root causes—unsecured garbage and other human attractants—with the goal of keeping people safe and reducing the number of bears FWP has to kill or relocate,” says Ken McDonald, chief of FWP’s Wildlife Division. “It’s also essentially neighbors helping neighbors.”

McDonald says FWP often has to euthanize bears habituated to human foods (hence the saying, “a fed bear is a dead bear”), as relocated bears, even when they’re released miles away, often return. Bears that hover near homes and cabins looking to raid human attractants usually must be trapped and euthanized to protect human safety.

The four-step Bear Smart program starts with a community naming members of a Bear Smart committee to assess how and where bear-human conflicts are taking place and then craft a detailed plan to address those issues. The fourth and final step is carrying out that action plan.

Missoula’s Bear Smart Committee includes FWP bear experts, representatives from the two waste-disposal companies (Republic Services and Grizzly Disposal), conservation nonprofits, as well as city and county officials and community volunteers.

“If there was ever a place for a Bear Smart Community, it’s Missoula, home of the University of Montana Grizzlies,” says committee member Chris Servheen, who served the past three years as president and chair of the Montana Wildlife Federation. Prior to that he worked as grizzly bear recovery coordinator for the U.S. Fish & Wildlife Service (USFWS) for 35 years. USFWS’s current grizzly bear recovery coordinator, Hilary Cooley, works on campus at the university along with at least 10 other bear biologists. In fact, Missoula may well be home to more wildlife biologists per capita than any city on earth, one reason the bear smart idea has been brewing there for a quarter-century.

As early as 2000, neighborhood “bear

aware” groups began to form and advocate for limiting human attractants. Their first win came in 2006 with an ordinance to end intentional feeding of wildlife (with the exception of bird feeders) within city limits.

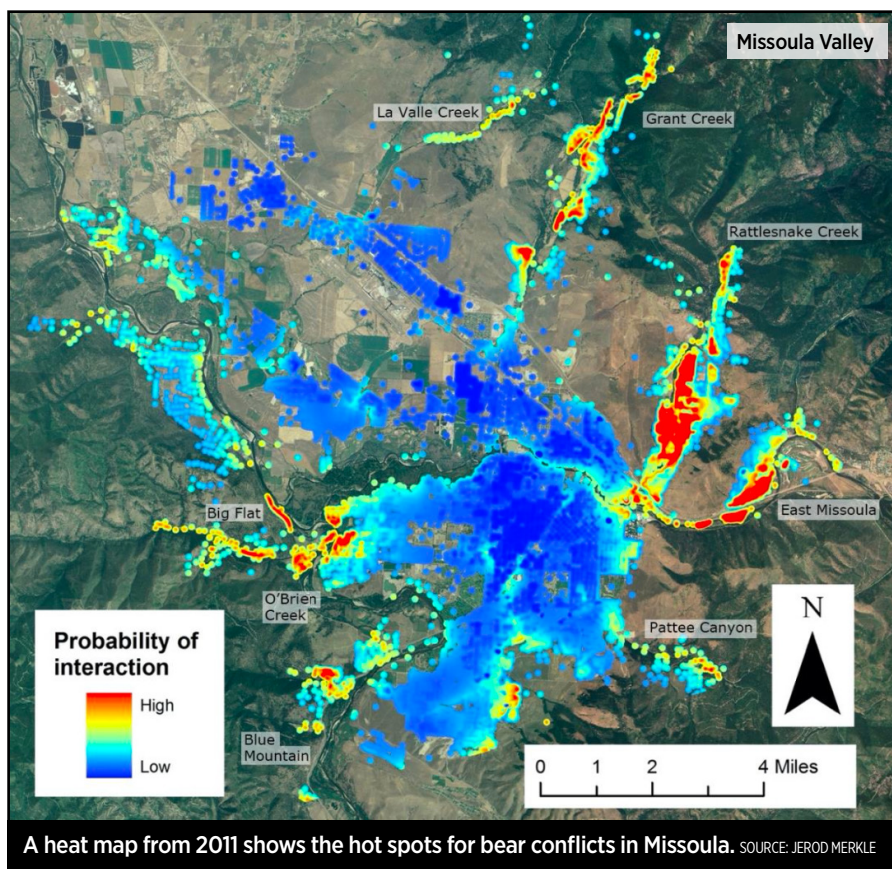
Jonkel says Missoula’s topography is a bear magnet. “In late summer into fall this bowl-shaped valley is still lined with green riparian habitat. The mountain ranges all around might be dry, but three sizable rivers and a dozen smaller drainages flowing in from every direction are covered in choke-cherry, hawthorn, and other natural foods,” he says. What’s more, the city’s large urban

deer herd produces newborn fawns that bears prey upon, and thousands of apple and other fruit trees have been planted around the valley. “Combine that with all the people living here who have unsecured garbage, bird feeders, dog food, and other attractants, and you’ve got both a natural food cornucopia and a death trap for bears once they get hooked on human foods.”

In 2009, Jonkel helped launch a missoulabears.org website and Facebook page, which still serve as primary information resources to help reduce human-bear conflicts and increase community engagement.



In Missoula’s Rattlesnake area, FWP recorded more than 40 bears working the garbage can circuit in 2023.



A heat map from 2011 shows the hot spots for bear conflicts in Missoula. SOURCE: JEROD MERKLE



SCRATCH AND SNIFF Bear-resistant trash cans keep bruins at bay but play nice with garbage truck dumping mechanisms.

The City of Missoula established a buffer zone in 2010 requiring bear-resistant trash containers if left outdoors overnight along with other measures to limit attractants in the Rattlesnake, East Missoula, Grant Creek, South Hills, and Miller Creek areas.

“That was only semi-successful because those locations are only partly within the city,” Jonkel says. “You might have one side of a street with bear-resistant trash cans and the other without. We needed Missoula County on board, too, for this to truly work. It only takes one person with an unsecured trash can or dog food on their porch to train 10 bears.”

In 2016, Missoula modified a fencing ordinance to allow electric fences around garbage storage facilities, orchards, gardens, and chicken coops. But as bear conflicts continued to escalate, and as Missoula’s population grew, so did complaints from the public.

The stakes increased in the fall of 2021 after FWP confirmed Missoula’s first resident grizzly in decades in the North Hills between town and the Snowbowl ski area—an adult female with three cubs captured on a game camera. Less than 24 hours later, those bears raided a chicken coop. Before the week was out, a North Hills rancher reported they’d broken into an abandoned cabin. FWP wardens found unsecured garbage outside the cabin and a



Leading causes of bear conflicts in the Missoula Valley



GARBAGE (49%)

Secure all garbage in a bear-resistant canister and keep inside a building until the day of trash collection.



BIRDFEEDERS (16%)

A 7-pound bird feeder can hold up to 18,000 calories. Put feeders away March through November when bears are most active.



LIVESTOCK FEED & PET FOOD (8%)

Do not store pet food or feed pets outdoors.



FRUIT TREES (8%)

Shield fruit trees behind electric fencing and pick fruit as soon as it's ripe (both from the tree and the ground below).



HUMAN FOOD & FREEZERS (6%)

Always store food indoors.



LIVESTOCK DEPREDAATION (3%)

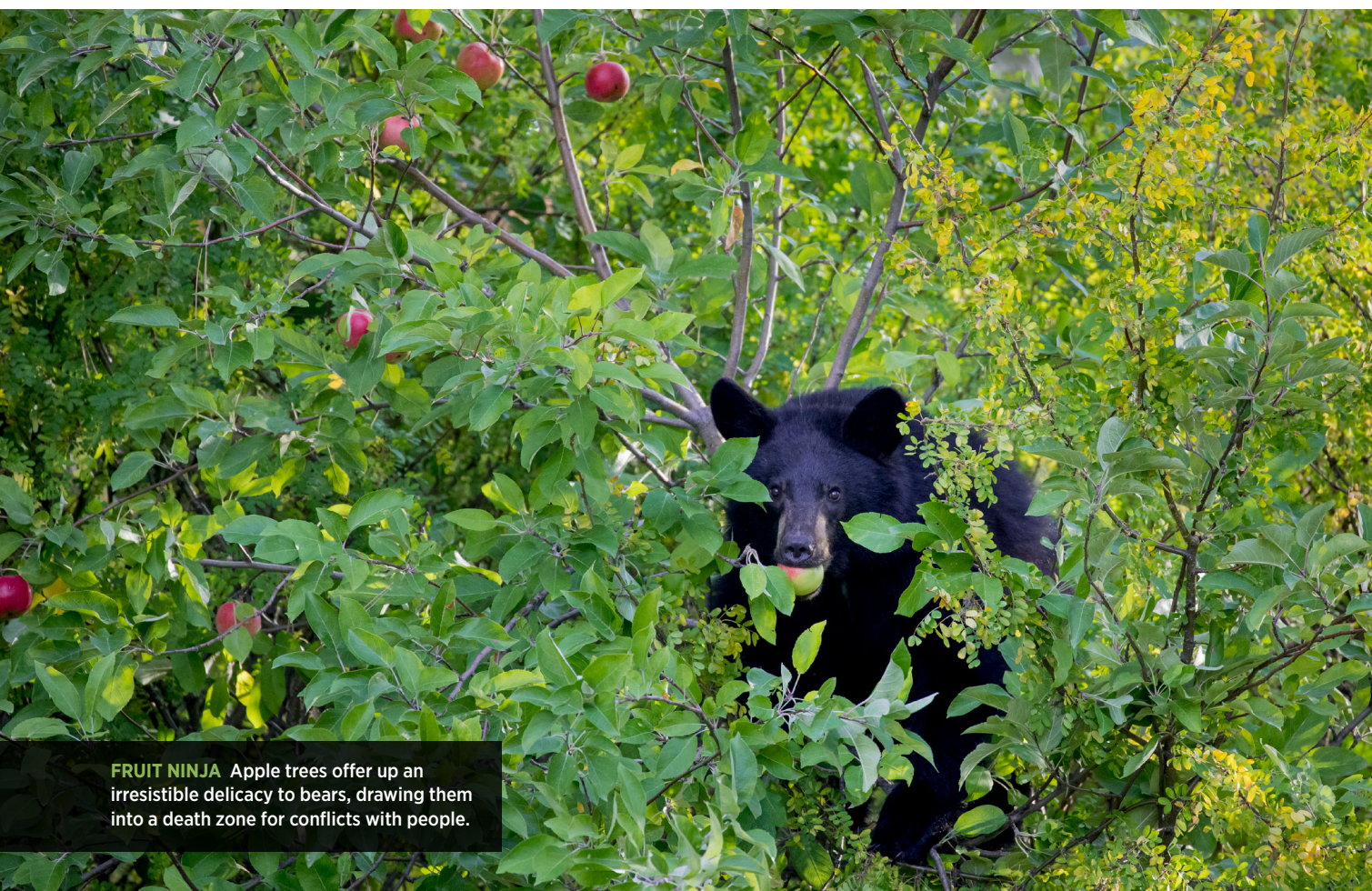
Shield livestock with electric fence or within buildings, especially during lambing and calving.



OTHER (10%)

Includes beekeeping, compost piles, smokers, barbecues, hunting season carcasses, garden vegetables.

Statistics based on human-bear conflicts in the Missoula Valley reported to Montana Fish, Wildlife & Parks, 2018–2021.



FRUIT NINJA Apple trees offer up an irresistible delicacy to bears, drawing them into a death zone for conflicts with people.

freezer full of rotting meat within. These grizzlies continued to raid cabins and garages into the fall but avoided capture.

The following spring, a mountain biker discovered a severed grizzly bear leg lying in the middle of the Snowbowl access road. What caused the amputation remains a mystery, but in late May, FWP biologists managed to capture two of the grizzly offspring—one missing a front leg—in Twin Creek northeast of Bonner. It's still unknown what became of the mother bear and the other sibling.

Since then, FWP has documented additional grizzly activity in the Missoula area, “but so far none have exhibited food-conditioned behavior,” Jonkel says.

Luckily the same measures Missoula is taking to limit attractants for black bears should also help discourage grizzlies.

In 2023, the city and county adopted new regulations for using IGBC-certified, bear-resistant trash containers delivered to most residences by local waste-collection companies. To give these companies time to purchase and distribute the upgraded cans, Missoula crafted a three-phase rollout

that started in May 2024 with the Rattlesnake and Grant Creek areas, followed by the University of Montana, Pattee Canyon, and Farview areas in May 2025. By May 2026, most of the valley should be switched over to bear-resistant cans and dumpster enclosures.

As Missoula prepared to approve the new regulations, the nearby small community of Potomac in the lower Blackfoot Valley asked to join in. In recent years, grizzlies have become much more common in the Blackfoot. One huge male grizzly caught on camera in Potomac looked nearly as big as the dumpster it was sifting through.

“To me the most amazing part is that Potomac residents raised their hands and said, ‘Regulate us, too,’” says Radley Watkins, executive director of the Missoula Conservation District. “We’re talking about a rural community where regulations are not normally viewed as favorable, but they said, ‘Please loop us in.’ I can’t think of another time where I’ve seen a community like that ask to be regulated.”

Jonkel says bear complaints from Potomac have dropped significantly since

residents switched to bear-resistant trash containers. “The year before the ordinance kicked in, things were insane all over Missoula County. Our management approaches of trapping, relocating, and euthanizing just weren’t working. But once the community removed the main attractant, there was a marked change in conflicts.”

Bert Lindler is also a member of Missoula’s Bear Smart Committee and a longtime volunteer at area “bear aware” events. He lives in Missoula’s Grant Creek neighborhood, where he has served on homeowner associations and neighborhood councils since the 1990s.

“This area has struggled with bear problems for more than two decades,” he says. “The night before trash day used to be a bear block party up here. We worked with the trash companies to arrange a later pickup to help residents put trash out the day of collection, and the problem is largely resolved now that everyone has switched to bear-resistant trash cans. We still have bears occasionally getting into trouble, but they’re not roaming the streets at 3 a.m. anymore knocking over every can.”

A FED BEAR IS A DEAD BEAR

Whether they are knocking over trash cans or raiding bird feeders, outdoor pet food, or fruit trees, bears that eat human food or garbage aren't likely to stop until it kills them. As they grow bolder, they may break into outdoor freezers, vehicles, and homes. Once they lose their instinctive fear of people, bears can be unpredictable and dangerous. FWP has little choice but to euthanize animals that pose a risk to public safety.

DO YOUR PART TO PROTECT PEOPLE AND BEARS:

- Store garbage and recycling inside a secure building and in a bear-resistant trash canister.
- Don't put trash out until the morning of pickup, and don't overfill bear-resistant containers, so they can shut and lock properly.
- Don't place freezers or pet food outdoors.
- Shield fruit trees behind electric fencing and pick ripe fruit quickly.
- Consider removing bird feeders or at least putting them in storage March through November, when bears are most active and birds don't need supplemental feed.



Bear-resistant storage cans in Virginia City.



Rattlesnake Elementary School in Missoula cages its dumpsters to keep out the bears.

GOOD IDEAS ARE CONTAGIOUS

Montana is home to an estimated 13,000 black bears, which roam every corner of the state, along with an expanding population of roughly 1,500 grizzlies. Although Missoula is now America's largest Bear Smart Community, it wasn't the first. That prize goes to the tiny historic mining town of Virginia City, Montana, population 242.

A destination for thousands of visitors headed to Yellowstone National Park, it's also situated along a popular corridor for bears. Virginia City Mayor Justin Gatewood says when he moved there in 2001, bear encounters in town were commonplace as bruins took advantage of unsecured trash cans.

"We had bears toppling trash cans right on historic Main Street," he says. "They got very conditioned to an all-you-can-eat buffet right in the middle of town. Then as a community we changed out all the garbage cans for bear-proof containers starting in 2017. It's made an enormous difference. The town feels much safer, and we have far fewer food-conditioned bears causing problems."

Virginia City began this effort more than 10 years ago, bolstered by a range of partners including People and Carnivores and

a USFWS Cooperative Recovery Initiative grant that paid for bear-resistant steel garbage cans in downtown and a secure dumpster site for residents.

With Missoula joining the effort, this program is catching the attention of other towns across Montana. Whitefish, Gardiner, Big Sky, Alberton, Choteau, and Polebridge are all at various stages of becoming Bear Smart communities.

"Knowing how many communities are struggling with bear conflicts, it's really encouraging to see all that interest," says FWP wildlife research assistant Lori Roberts, who headed up the committee that crafted the Bear Smart program. "I see community members, nonprofits, and other groups using our templates to approach their community to say, 'Hey, we know there is a problem, and here are some proven ways we can help reduce bear conflicts and increase human safety.'"

"FWP staff do our best to educate each individual household, but there are only so many of us," she says. "When a community rallies around the Bear Smart idea, though, you really start to see a large reduction in bear conflicts. It'll never be zero, but we can substantially reduce it." 🐻



Electric fences are the best way to shield fruit trees.



Bear-resistant sidewalk garbage and recycling cans in Virginia City.



Upland Imports

Transplanted from other states or other continents, Montana's introduced upland bird species are now a welcome presence for many hunters. Here's how they arrived and where to find them.

By Jack Ballard

“On the boats and on the planes, they're coming to America,” wrote Neil Diamond in his 1980 hit song. Inspired by his grandparents' escape from Russia, “America” saluted the millions who flocked to the United States in search of opportunity and freedom.

Boats and planes also transported wildlife to the New World. Of the eight species of upland game birds with hunting seasons in Montana, only half are native. Here's how the state's four upland imports became established and where they tend to flourish.

RING-NECKED PHEASANTS

Native to China and other parts of Asia, ring-necked pheasants were the earliest foreign upland bird species to become established in the West. Oregon successfully introduced pheasants in 1881. Among the first releases in Montana were birds brought to the Bitterroot Valley by the Butte copper baron, Marcus Daly, in the late 19th century.

For the next several decades, private pheasant enthusiasts and the state released tens of thousands of pheasants. Every county in the state participated. A bird farm

established at Warm Springs in 1929, by what was then called the Montana Fish and Game Department, rapidly expanded previous efforts. Within a few years the facility supported the annual release of around 15,000 pheasants. Three additional state bird farms in Fort Peck, Billings, and Moiese surged the yearly release count to 37,000 by 1946. One of the more innovative (but only marginally successful) production programs distributed pheasant eggs to 4-H clubs. The clubs received 50 to 75 cents for every bird reared and released.





EARLY EFFORTS A Fish and Game Department crew releases pen-raised pheasants in western Montana.
PHOTO COURTESY OF TERRY LONNER

Once the species was established across much of the state, the 1927 Montana Legislature authorized a pheasant hunting season. As the inaugural two-day season approached in November 1928, some authorities predicted that hunters would decimate the newly established population, but the harvest proved underwhelming. Season lengths and limits increased without affecting numbers. In some areas, early seasons even allowed the harvest of cocks and hens.

Today, the pheasant season begins on

the second Saturday in October and extends until New Year's Day with a daily bag limit of three male (rooster) pheasants. Like other states, Montana limits the taking of pheasants to males. The roosters' colorful plumage makes them easy to identify, and numerous studies have shown it's essentially impossible to diminish pheasant populations if only harvesting male birds.

By the onset of World War II, pheasants had actually become too numerous in the Billings and Hardin areas, eating so many crops that they were poisoned to lower

numbers. But just a few years later, habitat loss and adverse weather severely reduced pheasant numbers statewide.

Montana is the northern limit of the pheasant's range in North America. To survive here, the birds need three things: grain, grasslands for nesting, and winter cover (wetlands and shelterbelts). During the 1970s, numbers drastically declined as large tracts of grasslands were plowed and

Writer and photographer Jack Ballard lives in Red Lodge.



planted with wheat, soybeans, and barley. The additional grain was beneficial, but the destruction of nesting cover meant there were few birds to eat it.

The federal Conservation Reserve Program (CRP), which began in the late 1980s, helped restore pheasants almost to their former glory. In the program's peak years in the early 2000s, Montana had roughly 3 million acres of CRP grasslands. Rooster numbers boomed. Montana's annual pheasant harvest increased from an average of 84,000 birds in the years before 1985 to an average of 124,000 from 1986 to 2009.

Since then, the federal government has reduced CRP acreage in Montana and other northern states, causing pheasant numbers to drop. FWP helps landowners enroll in—and stay enrolled in—CRP through the Upland Game Bird Enhancement Program, and provides habitat management leases on non-CRP lands to help protect nesting sites and other important cover.

Spring snow storms have also hampered bird productivity in recent years, while hail in late June and early July can kill newly hatched chicks. And ongoing drought has withered much of the state's nesting habitat.

As a result, pheasant numbers have dwindled. Over the past 10 years, the yearly harvest has averaged just over 91,000 birds.

Every year since 2022, FWP has released thousands of adult pen-raised pheasants at wildlife management areas, fishing access sites, and some school trust lands around the state. Hatched and reared at the state prison in Deer Lodge, these birds are meant to provide easier hunting for youth and other beginners, with the aim of recruiting more hunters into the field.

GRAY (HUNGARIAN) PARTRIDGE

The first shipment of gray partridges purchased for release by the Montana Fish and Game Commission arrived from Europe by boat in 1923. But the birds were recorded in the state even earlier.

In 1915, a dead gray partridge was discovered in Sanders County, possibly a Canadian import. Gray partridges were released near Calgary, Alberta, in 1908. According to Arthur Cleveland Bent, a prominent ornithologist of the era, birds from the Calgary plant fanned out 400 miles across Canada in just 14 years. With the Montana border a mere 150 miles from Calgary, it's conceivable gray partridges made their way across the border.

Native to much of Europe and Asia, the birds are also known here as Hungarian partridges, for the origins of some early imports to the United States.



RING TOSS Montana game managers released 10,000 pheasants to supplement wild populations in 1972. Hunters harvested almost 70,000 birds that same year.

FROM LEFT: DAN WALTERS; BILLINGS GAZETTE



LET OUT THE CLUTCH
A *Billings Gazette* article from 1950 shows a batch of 6-day-old pheasant chicks at the Billings state game farm, which produced more than 10,000 birds that year released in 20 counties across eastern Montana.

Between 1923 and 1926, state game crews introduced 6,000 gray partridges from Europe. A handful of trapping and relocation efforts over the next decade further expanded the partridges' range. Using teams of men canvassing every township, game bird surveys were conducted by the Montana Fish and Game Department in the 1940s. They concluded that the gray partridge had become the most widely distributed game bird in Montana, less than three decades after their official introduction to the state.

Like pheasants, gray partridges thrive in grain-growing regions. However, they do best in areas that are drier, have shorter grasses, and lack dense brush or cattails for winter cover. On my boyhood home west of Three Forks, my father cultivated a patchwork of wheat and barley fields interspersed with native pasture and a few hayfields. A neighbor rotated wheat crops on "strip" fields separated by brushy wind breaks. Although they didn't hunt partridges and had no intention to do so, Dad and the neighbor created superb partridge habitat. Frequently, while I was trailing milk cows to the barn or repairing barbed wire fence, an explosive, startling flush of partridges at close range sent my heart racing.

One of the most notable characteristics of gray partridges is their remarkable reproductive efficiency. Females may lay up to 22 eggs, and when conditions allow, brood survival can top 50 percent in exceptional years, with a dozen chicks sometimes still tagging along with mom as hunting

season opens September 1. Each year, Montana upland hunters harvest roughly 28,000 gray partridges.

CHUKAR PARTRIDGE

Like gray partridges, chukars were transplanted from Europe, but the birds didn't take to Montana with the same enthusiasm. The native range of chukars includes a wide swath of Europe and Asia from the Balkans through the Middle East to northern India, China, and Mongolia. Montana's first documented releases occurred in 1933 along the Yellowstone River near Glendive. An analysis by the American Museum of Natural History concluded that the chukars released in Montana were from a variety that originated in India.

For the next several years, managers stocked limited numbers of chukars in 16 counties in a wide range of habitats. Then in the 1950s, the state released another 5,000 birds in various habitats.

The chukar-release programs proved far less successful than those for pheasants or gray partridges. By 1970, southern Carbon County was the only place in the state where a hunter could regularly find chukars, and the same is true today. The birds are also occasionally spotted in the Bitterroot, Beaverhead, Madison, Flathead, and other valleys across the western half of the state.

Chukars thrive in steep, rocky terrain, but suffer in areas with consistent snow cover. In Montana, that limits where they can survive in what would otherwise appear to be viable habitat. They are often found





FLOCK TENDERS

While working for Fish and Game, Robert Eng (left) and Bob Greene were instrumental in Montana's upland bird management, including pheasant releases beginning in the 1950s. Greene ran the state pheasant farm at Warm Springs for 33 years.



in areas with lots of non-native cheatgrass, but will readily forage on alfalfa and grains when available. Fleet of foot, chukars prefer to elude danger by running uphill rather than flying like most upland birds. When they do flush, their flight is similarly explosive to that of gray partridges. Birds pinned in cover with no obvious escape route on foot sometimes hold well for pointing dogs. But in general, chukars can be maddeningly difficult to hunt, even for advanced shotgunners with seasoned dogs.

FWP hunting regulations now lump chukars in as part of an aggregated eight-bird limit with gray partridges. My wife, who loves pheasants, would disagree, but I consider the delicate white meat of a chukar to be the most delicious of all upland birds.

WILD TURKEY

Montana's largest upland game bird is also a relative newcomer. The native range of the wild turkey historically extended only as far north as southern South Dakota. It was just too cold north of there for the birds to survive.

That is, until the widespread planting of corn, alfalfa, wheat, and other crops provided enough calories for turkeys to make it through Montana winters, and in recent years, even as far north as southern Canada.

Several attempts by private parties to release pen-raised wild turkeys failed to establish populations to the Treasure State in the 1930s. In 1954, the Montana Fish and Game Department acquired wild-trapped Merriam's turkeys (a subspecies) from Colorado in exchange for mountain goats, and the birds were released in the Judith Mountains northeast of Lewistown. Turkeys of the eastern subspecies brought in from South

Dakota were also released over the next few years around Ekalaka and Ashland. These wild birds flourished, and within a decade, some of their descendants were trapped and relocated to 19 sites around the state. In the meantime, private individuals successfully established populations of the eastern subspecies to the Flathead Valley as well.

Today wild turkeys are found in every one of Montana's 56 counties. Concentrations are highest in the Flathead Valley, the Missouri River Breaks, and the state's south-eastern region.

Montana's first turkey hunting season was held in 1958. Today the state offers hunting seasons in both spring (males only) and fall (either sex).

Wild male turkeys can weigh more than 20 pounds, roughly eight times that of a rooster pheasant. Turkeys are remarkably swift of foot, but when pressed can quickly take to flight.

Wild turkeys prefer open forests and edges near agricultural crops, especially grains. In recent decades, enterprising birds have taken up residence in various communities across Montana, finding abundant feed in parks, at bird feeders, and across lawns. The more widely distributed Merriam's variety favors ponderosa pine woodlands and riparian areas. Turkeys thrive in brushy cover with high-calorie food sources that help them maintain their body temperature and survive winter cold.

Concentrated populations of wild turkeys can be a problem for agricultural operations where the birds defecate on or eat silage, hay, and other feed stocks. In suburban areas, turkeys may defoul neighborhoods with their excrement. Toms can become aggressive toward people during the



TRADED FOR TURKEYS

In 1954, Montana wildlife managers acquired wild-trapped Merriam's turkeys from Colorado in exchange for mountain goats.

spring mating season, and they occasionally damage the finish of vehicles by attacking their own reflections in the paint. But for the most part, turkeys have integrated well with their human neighbors and other wildlife.

PRIZED IMPORTS

One of the persistent fish and wildlife management concerns when it comes to non-native creatures is their harm to endemic species. For instance, non-native American bullfrogs voraciously eat native frogs and toads, English sparrows bully native songbirds, and brook trout brought here from eastern states outcompete Montana's native cutthroat trout.

Fortunately, according to FWP upland bird biologists, Montana's naturalized,

non-native upland birds don't dampen the fortunes of native species. Near my home in Red Lodge, I have harvested pheasants, gray and chukar partridge, sharp-tailed grouse, and sage-grouse all within a few miles of each other. I've seen pheasants and sage-grouse foraging in the same field in peaceful coexistence. Ditto for sharptails and gray partridges.

Biologists tell me that's also the case elsewhere in Montana. For reasons not fully understood, the newcomers seem to coexist well with the native birds. This fall, I'll be back out in pursuit of these prized imports with my wife Lisa and our English setter Percy. Those birds may not be native to the state, but we don't think Montana would be quite the same without them. 🐾



GOBBLE AND GO Wild turkeys embark on a new life in the Gallatin Valley after being trapped near Ashland. Before this transplant by FWP and the National Wild Turkey Federation in the 1990s, southwestern Montana was the only region of the state without a huntable turkey population.

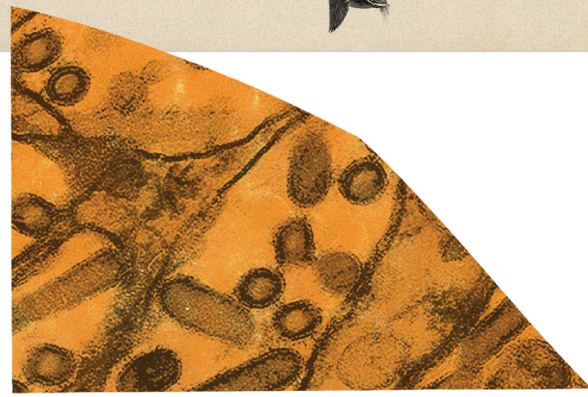


OBIN
 LEUCOCYTE COUNT
 DENTIAL LEUCOCYTE COUNT
 NEUTROPHILS
 LYMPHOCYTE
 MONOPHILS
 YTES
 LS
 NT
 NT
 ALUE, HCT
 CULAR VOLUME, MCV
 LL HAEMOGLOBIN, MCH
 MEAN CELL HAEMOGLOBIN CON, MCHC

Clinical No
 A complete
 infection, an
 capillary blo

Possible c

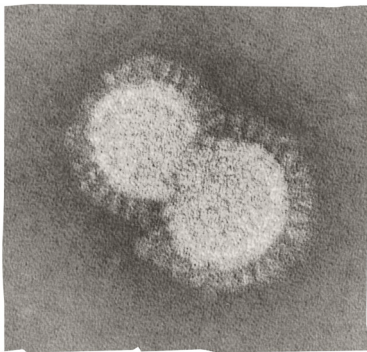
RBC, Hb, c
MCV
WBC
Platelets



Interconnected

More and more wildlife diseases are being detected in Montana.
Keeping tabs on them helps protect domestic animals and people, too.

BY JULIE LUE. ILLUSTRATIONS BY BLAKE CALE



The H5N1 avian influenza virus under high magnification.

A particle of the highly pathogenic avian influenza (HPAI) virus is just a bit of genetic material coated in protein, enveloped in a fatty membrane, and shaped like a pretzel rod or a spiky sphere that might, if you magnified it 670,000 times, resemble a rubber toy your dog would chase across the backyard. It can't even move on its own. But there's no question that the avian flu virus has a powerful reach.

Montana's relative remoteness has provided little protection from a pathogen that can migrate with birds, particularly waterfowl. The H5N1 strain arrived here in early 2022 after spreading across the world and eventually to North America. Especially destructive to domestic poultry and some species of wild birds, the virus has also infected some 1,000 U.S. dairy herds and a wide range of other mammals—including humans.

HPAI is one of several emerging diseases to hit the Treasure State recently. Rabbit hemorrhagic disease virus, sometimes called "bunny Ebola," was detected in 2021. The fungus that causes white nose syndrome (WNS), which has killed millions of hibernating bats in North America, was first detected here in 2020, as was the virus that causes COVID-19, which has proved capable of infecting both humans and wildlife. Chronic wasting disease (CWD) was detected in the state's wild deer populations by 2017. And pigeon paramyxovirus had

arrived on the scene by 2010.

These newcomers join a long list of existing diseases: bighorn sheep pneumonia, brucellosis, rabies, epizootic hemorrhagic disease (EHD), tularemia, plague, chytrid amphibian fungus, and a host of others, including some that sicken or kill fish.

Clearly, wildlife managers have a challenge on their hands. "I call it a growth industry," says Ken McDonald, chief of FWP's Wildlife Division in Helena. "It seems like we just keep adding more issues, like CWD, which has gone from almost nothing in the last five years to a huge program of surveillance and testing and monitoring."

But as diseases have increased, FWP has ramped up its ability to respond via its Wildlife Health Program (WHP), led by wildlife veterinarian Dr. Jennifer Ramsey in Bozeman. The WHP doesn't make wildlife management decisions; instead, it supplies answers to wildlife managers as they weigh decisions related to health, disease, and wildlife population management.

"With the Wildlife Health Program and the wildlife health expertise we have on board," McDonald says, "we're a lot better prepared now than we were 20 years ago."

The big question, given the rapid increase of diseases across the state, is whether that preparation can protect Montana's wildlife populations and livestock—not to mention hunters, ranchers, and others who come into contact with animals.

A frequent contributor, Julie Lue writes from Florence in the Bitterroot Valley.



DON'T GOOGLE BEFORE BREAKFAST

The WHP addresses a range of issues that affect wildlife health, including disease and parasites, environmental toxins (like lead, pesticides, or herbicides), nutrition, genetics, and animal welfare. Staff spend time in the field conducting mortality investigations, collecting samples, and helping capture and radio-collar wildlife. Home base for the program is the Wildlife Health Lab in Bozeman, where Ramsey and veterinary technician Matt Becker conduct necropsies—animal autopsies—to investigate what is sickening or killing animals.

On a frosty fall morning, the lab's steel workbench holds the head of a cow moose found dead near Mill Creek, east of Sheridan. It's not always possible to transport an entire moose to the lab, but this head will provide a sample for CWD testing and another for a U.S. Department of Agriculture (USDA) study about the COVID virus in wildlife (it has been found in white-tailed deer). Ramsey will also dissect the head in search of a parasite you might not want to Google before breakfast: arterial worm.

The adult worms coil tightly in the arteries of the head and neck, restricting blood flow to the head and brain of its host. Mule

deer have a natural resistance to the worm, but moose, elk, whitetails, and bighorns can develop blindness, neurological problems, or ear, muzzle, or antler/horn deformities. Then again, they may show few outward signs. "We commonly find arterial worms in moose that are simply found dead. Often they don't look that unhealthy," Ramsey says. This moose, which has a stubbed-off ear tip, is infected, though it's uncertain whether arterial worms are what killed her.

FWP can't necropsy every dead wild animal found in Montana. But when there's an unexplained mortality, a die-off of multiple critters, or a potential exposure of people or domestic animals, the case is likely to get the agency's attention. Say a landowner finds dozens of dead doves on their property. Or a deer dies in a field used by cattle. Or a skunk is seen staggering around a horse corral in daytime. Determining what's responsible can give people peace of mind or help them decide what precautions to take. The necropsy may also uncover a new pathogen or outbreak, possibly even allowing it to be stamped out before it spreads.

As for a wobbly skunk, most of us probably think of rabies. But Ramsey says that many mammals showing neurological signs

are tested post-mortem for distemper and avian influenza as well. "We've had bears, foxes, skunks, raccoons, mountain lions, and black and grizzly bears with HPAI, and their symptoms are indistinguishable from the rabies virus," she says.

Depending on the disease or parasite, necropsy results may be relevant not just for FWP but also the Montana Department of Livestock (DOL), the Department of Public Health and Human Services (DPHHS), or the federal counterparts of these agencies.

"We look at it these days through a perspective of what's called 'One Health,'" Ramsey says. "Instead of wildlife folks being in their own little bubble over here, worrying only about wildlife, and the livestock folks only worrying about livestock, and public health just thinking about people, we are constantly communicating and sharing information. Because what we now realize is all this stuff is connected."

When Ramsey and other FWP officials are identifying priority diseases that will receive the most time and attention, she says, "we're also thinking about whether there are any things we need to be concerned about affecting our human population or our agriculture industry."

SUSCEPTIBLE POPULATIONS

Are more wildlife diseases reaching Montana these days, or are scientists just paying more attention, detecting some that have been here all along?

“It’s a bit of both, but we’re definitely seeing an uptick in disease emergence,” says Dr. Emily Almberg, an FWP disease ecologist with the Wildlife Health Program in Bozeman. This is partly due to how people move pathogens and animals around, change the landscape in ways that push animals into new contacts with other species, and raise large numbers of domestic animals for agriculture. All this provides greater opportunity for pathogens to spread and change.

Though diseases are a natural part of wildlife ecology, Almberg says, “We start to worry when we get newer pathogens for which a population has no previous exposure, so they’re much more susceptible. Often that’s where we see conservation-level impacts to a species and big declines.”

To pick a few examples: White nose syndrome has pushed some bat species, like the

northern long-eared bat, onto the federal endangered species list. CWD has thinned deer numbers in areas with high prevalence, causing some Colorado mule deer herds to decline by 45 percent over 20 years. Sylvatic plague has put the brakes on endangered black-footed ferret recovery, both by driving down numbers of prairie dogs, their main prey, and sickening the weasel-like predators themselves.

Disease transmission from domestic species to wildlife is also a major concern. For instance, bacteria carried by domestic sheep and goats can “spill over” to infect bighorn sheep, leading to a deadly form of pneumonia. Infected bighorns can then transmit the disease to other wild populations. Since 1979, Montana’s once-spectacular bighorn herds have experienced over two dozen die-offs from this devastating illness, which recently decimated a wild sheep herd in the Missouri River Breaks and caused some sheep to die in the Skalkaho area east of Hamilton. Even a healthy herd can be one contact away from disaster.



Keeping bird feeders from spreading bird flu

Songbirds don’t often contract highly pathogenic avian influenza (HPAI), but spilled seed underneath feeders can attract pheasants and wild turkeys, which are more susceptible to the disease and consequently more likely to transmit it to backyard poultry flocks or other animals. Because HPAI can be spread through droppings, bird feeders should not be placed near chicken coops or where domestic birds will be walking around. Experts also recommend using disposable gloves when touching bird feeders and birdbaths, which should be disinfected regularly to reduce risk of spreading diseases like salmonella and conjunctivitis.

WILLIAM MOESSNER



“What we realize now is all this stuff is connected.”





Fish get sick, too

Ever since whirling disease arrived in the mid-1990s, FWP's fish health program has tested fish raised in hatcheries or moved from one waterbody to another to help ensure they are free of certain pathogens.

"The heart and soul of our program is prevention," says FWP fish health coordinator Ken Staigmiller, based in Great Falls. "But we're getting pulled more and more into disease management."

Yet determining what is making a fish sick gets complex. Pathogens are always present in the water, and it's widely thought that stress plays a role in how susceptible fish are to disease, whether from high water temperatures, low flows, poor water quality, or angling pressure.

Fish health is getting added attention recently because of near-historic lows in trout numbers and reports of fish with fungal infections and head necrosis in the upper Jefferson River basin. FWP is working with Montana State University and other partners to study how environmental stressors, fishing, and other recreational uses affect trout in the Big Hole, Beaverhead, Ruby, and Madison rivers. Some trout numbers increased in 2024, and fewer than 1 percent of those captured for study showed signs of the fungal disease. Staigmiller also noted that, so far, no new disease has been identified.

To help keep fish healthy, he recommends anglers follow the same "Clean, Drain, Dry" practices recommended for aquatic invasive species (clean boots, waders, and other items), and to minimize handling and keep fish in the water as much as possible when catch-and-release fishing. Report sick fish (preferably with photos) at sickfish.mt.gov, or tagged fish at mtcfru.org/msutag.

Diseases that spill over into wildlife can spill back.

And diseases that spill over into wildlife can spill back. Bovine brucellosis was originally transmitted from cattle to bison and elk, which now serve as a reservoir for the disease. Brucellosis has been mostly eliminated in cattle thanks to an aggressive testing and culling program by USDA and a helpful if not perfectly effective vaccine. "But there is now a significant effort to protect livestock from infected wildlife," McDonald says. "Management of wildlife populations to minimize threats to livestock then becomes a major driver of what we do."

Concerns about spillover and reservoirs also explain why FWP staff watch out for bovine tuberculosis (bTB); in parts of Michigan, white-tailed deer serve as a reservoir for bTB.

"If it shows up, we need to take some pretty immediate actions to prevent the spread in wildlife to then prevent the spread to Montana livestock," says McDonald. "Otherwise, there's going to be more pressure on us to drastically reduce deer numbers."

THE HUMAN CONNECTION

As we've seen with COVID-19, spillover can be a problem in people, too. Montana's list of zoonotic diseases (transmitted between animals and humans) includes some fearsome names: rabies, plague, and tularemia (which is caused by a bacterium so infectious it's considered a potential bioterrorism agent).

HPAI is zoonotic as well, though the current strain doesn't spread readily among people. That could change. "It's up to us to make sure HPAI doesn't become a problem," says Devon Cozart, an epidemiologist with DPHHS in Helena. "The more contact

we have with HPAI and animals that are sick with it, the more likely it is to adapt to humans and then start spreading from human to human."

From a wildlife management perspective, McDonald is concerned that if this occurs, people might demand eliminating entire populations of waterfowl and other migratory birds.

He also cautions that, "Even if a disease might not make you sick, it can still cause problems." And he's not just talking about the price of eggs. Endangered species designations can affect land use and how wildlife agencies allocate their time and resources. Fish die-offs can cause river closures (like on the Yellowstone River in 2016), and declines in big game can result in reduced hunting opportunity. "We saw that a few years back when we eliminated all deer B tags in a season as a result of a significant EHD outbreak," McDonald says. There also can be economic implications for communities that rely on animal agriculture or wildlife-related tourism, including hunting, fishing, and wildlife watching.

Sometimes consequences can be much harder to predict. One University of Chicago researcher has even linked the decline of insect-eating bats from WNS to higher infant mortality as a result of increased pesticide use for farming.

IMPERFECT TOOLS

Once a disease becomes endemic in free-ranging wildlife, it can be difficult or impossible to eradicate. Usually there's no vaccine or treatment, even if you could find a way to deliver it. "You can't very easily run



VALUE
15
5,100
79
18
1
1
1
3.5
5
42
84.0
30.0
35.7

te overall h
reports of
se referenc

shock, chr
sease
nignancies



Most wildlife are healthy, and most game meat is wholesome.

But there is reason to be paying attention.”

deer or ducks through a cattle chute,” says Ramsey, a former private-practice vet who treated animals from tiny kittens to giant bulls.

But there’s often something wildlife managers can do to reduce effects on wildlife, livestock, or people. For wildlife, that might involve protecting habitat, reducing other sources of stress or mortality, or adjusting hunting seasons or quotas. But any action is likely to involve some trade-offs.

With CWD, testing can help track the infection, showing spikes in prevalence like that in northeastern Montana. And hunting can be used strategically to help reduce the prevalence of the disease over time, both by thinning deer herds where they are highly concentrated and by reducing buck-to-doe ratios, as bucks are more likely to be infected. But harvesting more bucks can be unpopular with trophy hunters who ask FWP to allow them to live longer to grow bigger antlers.

Brucellosis requires a different game plan. “Our tools to limit the spread in elk are limited,” Almborg says. So instead of trying to manage spread in elk, FWP is actively monitoring for the disease and trying to reduce the risk of spillover to cattle. Landowners can request FWP’s help with hazing elk away from livestock, stockyard fencing and fence modification, special management hunts to trim local elk herds, and kill permits.

Each winter, in coordination with the Montana Department of Livestock, FWP staff capture elk outside a designated brucellosis surveillance area in south-

western Montana, test for the disease, and radio-collar some of the animals. “If results are negative, it’s good news,” says Dr. Tahnee Szymanski, state veterinarian with DOL in Helena. “But we still utilize movement data from those elk to inform future decisions.”

NO FREE RIDES FOR PATHOGENS

Though these efforts may not necessarily eliminate an infection, they can help manage it. And Montanans can all make a difference, too—for better or worse. Because the health of people, domestic animals, wildlife, and the environment are all linked, “our actions can directly affect both the health of other species and our own health,” Almborg says.

One of the best ways to help is to avoid providing pathogens with a free ride to a new location or host. That means disposing of deer, elk, and moose carcasses in a Class II landfill, not picking up sick birds and bringing them home, not letting pets scavenge on dead wildlife, and practicing good biosecurity with poultry flocks and other domestic animals. People can also have FWP test their harvested deer, elk, and moose for CWD to try to reduce exposure (the Centers for Disease Control and Prevention recommends not eating the meat of CWD-positive animals).

Ramsey says that basic precautions can reduce much of the risk. Recommendations include wearing disposable gloves and practicing good hygiene when handling animals or carcasses or scrubbing birdbaths and bird feeders, not harvesting or eating meat from obviously

sick animals, and cooking game meat to at least 165 degrees (although unfortunately that doesn’t work for CWD). And if hunters find something strange when processing their animal and wonder if the meat is safe to eat, they should call their local FWP office or the WHP.

Ramsey also asks that people report their own observations of sick or diseased wildlife. “For both bighorn sheep and mountain goats, because they’re so hard for us to see, if folks are out and about and see something that looks suspicious or unhealthy, just giving us a phone call is really helpful,” she says. She notes that a hunter in northern Montana reported seeing something strange in bighorn sheep that may be contagious ecthyma, a viral disease that causes skin lesions. “We may have never known about this if that hunter hadn’t called,” Ramsey says.

And while the variety of diseases circulating in wildlife may seem overwhelming, the FWP veterinarian offers this perspective: “Most wildlife are healthy, and most game meat is wholesome. But there is reason to be paying attention.”

People should all be aware of what they may be exposed to and take common-sense precautions, but they don’t necessarily need to fret, Ramsey says. “We’re here so you don’t have to worry as much.” 🐾



Editor’s note: For information about wildlife diseases and public health issues, go to fwp.mt.gov/conservation/diseases



What you can do to help

Whether you're a hunter, hiker, or just someone who loves nature, simple actions—like reporting sick animals, testing game, and avoiding direct contact with wildlife—can make a difference.

CHRONIC WASTING DISEASE

Test harvested deer, elk, and moose for CWD—even in areas with no known cases.

- It's critical for FWP to know as early as possible when CWD has made it to a new area while the percentage of infected animals is still low. That requires a large number of samples, so do your part by having every animal tested, a free service provided by FWP.
- For instructions on how and where to submit a sample, visit fwp.mt.gov/cwd

Report sick animals.

- It's vital that FWP know as early as possible when CWD has spread to a new area. Use the contact information in the box at lower right to report any deer, elk, or moose that are emaciated, drooling, pacing, circling, have drooping ears, loss of coordination, or tremors.

Properly dispose of carcass parts you bring out of the field at a Class II landfill.

- These facilities bury garbage deep in the soil to shield it from contact with deer, elk, or moose that might contract CWD. Do not dump your leftovers after butchering, which can spread this disease to new areas.

Don't use food or salt blocks to attract animals.

- Feeding deer, elk, and moose is illegal in Montana, in part because any attractant that congregates animals increases the likelihood of CWD transmission.



WHITE-NOSE SYNDROME IN BATS

When visiting a cave or any structure with bats:

- Clean and disinfect your clothes and gear *before* you enter and *after* you leave to prevent spreading the fungus. The spores that cause white-nose syndrome cling to clothes, shoes, and gear, and can stay viable for years.
- Do not enter caves from October through the end of May to minimize disturbance during hibernation.
- Do not enter closed or gated caves or mines.

Report unusual behavior.

- Examples would be bats flying during the day December through March or roosting in sunlight on the outside of structures. Call FWP bat biologist Shannon Hilty at 406-590-3426 or FWP's Wildlife Health Lab.

Never touch a bat, living or dead.

- While most bats are not rabid, they can be infected with the rabies virus.

AVIAN INFLUENZA

Report sick wild birds.

- Report sick birds or birds found dead with no apparent cause to FWP's Wildlife Health Lab.

Avoid contact with wild birds.

- Even if a bird is not sick, always wear gloves if it must be handled or while cleaning bird feeders.
- People and equipment that come into contact with wild game birds should avoid backyard poultry flocks until cleaned and disinfected.

Precautions for bird hunters:

- Prevent dogs from consuming sick or dead birds. Do not harvest or handle wild birds that are clearly sick.
- Clean birds outdoors or in a well-ventilated area wearing disposable latex or rubber gloves.
- Wash hands with soap and water or with alcohol wipes immediately after you finish.
- Wash tools and work surfaces with soap and water, then disinfect with a 10 percent solution of chlorine bleach (one part bleach to 10 parts water).
- Dispose of scraps in a Class II landfill, and never feed scraps to pets or poultry.
- Keep raw meat away from cooked or ready-to-eat foods.
- Cook meat to an internal temperature of at least 165°F.



PNEUMONIA IN BIGHORN SHEEP

Pneumonia can be devastating to wild sheep herds. Immediately report to your regional FWP office if you see:

- Bighorn sheep coughing, with nasal discharge, or otherwise appearing sick.
- Bighorn sheep close to (or in contact with) domestic sheep or goats.
- Deceased bighorns in the wild.

RABBIT HEMORRHAGIC DISEASE



Report groups of sick or dead feral or wild rabbits.

- FWP staff will mark the location and determine whether the animals should be collected for RHDV-2 testing.
- Though RHDV-2 does not infect humans, rabbits can carry other diseases such as tularemia and plague that can pose a risk to human health, so avoid any direct contact.



To report diseases in wildlife, contact your regional FWP office (fwp.mt.gov/aboutfwp/contact-us) or call FWP's Wildlife Health Lab at 406-577-7880.



RAVENOUS RECORD-SETTERS

By E. Donnell Thomas, Jr.



RECORD BEATER Dan Caricaburu-Lundin hefts the world record 45.2-inch tiger muskie he caught in Montana's Ackley Lake in 2024. PHOTO COURTESY OF DAN CARICABURU-LUNDIN

Montana is home to some of the world's largest tiger muskies, a voracious **muskellunge-northern pike hybrid** that is attracting anglers from across the United States.

Last September, my wife, Lori, and I hauled our canoe to Ackley Lake near Hobson to fly fish for a remarkable fish species we'd never seen, much less caught.

We paddled along the cobbled shoreline, trolling outsized streamer flies on sink-tip lines, which purists may protest isn't really fly fishing. My position has always been that trolling a fly behind a motor-powered boat crosses an invisible red line that paddling a canoe does not. After all, this was an exploratory trip, and we needed to cover as much water as possible.

I usually make at least one trip to Ackley every spring when the stocked rainbow trout are cruising the shore looking for a spawning stream that doesn't exist.

But this day's mission was different. We hoped to catch a nearly mythical species that most Montana anglers know little about—a tiger muskellunge, commonly called tiger muskie.

In May 2024, angler Dan Caricaburu-Lundin of Great Falls arrived at the same location with a similar mission. However, he was far more experienced and focused. His friend had caught a world record tiger in New Mexico in 2022, and Caricaburu-Lundin was determined to land a bigger one.

He felt confident enough about his prospects to announce his intention on social media.

He was also smart enough to leave his fly rod behind, fishing with a homemade plug crafted in his own garage. He had caught plenty of tiger muskies on previous trips, and as soon as one struck he knew he had a record-class fish on the line. On shore, the fish measured just over 45 inches long.

The International Game Fish Association (IGFA) later confirmed it as a new world record length, beating out his friend's previous record by about 6 inches.

Oddly, what it didn't beat was the Montana state record, a 50-inch beast weighing more than 38 pounds caught by Leo Cantin in Deadman's Basin Reservoir in 2011.

Whether you're going after a moose or a muskie, official world record status must be certified by the appropriate organization. To ensure credibility, the process involves verification and paperwork that some hunters and anglers choose not to go through.

Thus, Caricaburu-Lundin's new world record from Ackley wasn't even the largest of its kind taken in the state—just the largest registered with the IGFA. And according to FWP biologists, the next few years may produce a new state record, world record—or both. But more on that later.



**It's like fishing
for an alligator.**

BALLISTIC BARRACUDAS

Tiger muskies are a vicious predator with a long, muscular body and a ducklike snout filled with razor-sharp teeth. Rather than dry flies, nymphs, or other typical Montana fly fishing fare, they tend to go after lures and massive flies that resemble fish, small mammals like mice and muskrats, and even ducklings. It's like fishing for an alligator.

To understand why they are the way they are, just look to their parents. A tiger muskie is a sterile hybrid produced by crossing male northern pike (*Esox lucius*) with female muskellunge (*Esox masquinongy*). They can also be produced by reversing these genders, but it turns out that muskie eggs are easier to handle in a hatchery.

Northern pike are familiar to most Montana anglers. Before European settlement, northerns were native only to the Saskatchewan River drainage on the east side of Glacier National Park. They've since become widespread across Montana as the result of legal stocking by the state decades ago and illegal planting in recent years.

The maternal half of the tiger muskie's genes, though, comes from a species few Montana anglers know about: the muskellunge, or muskie. Native to lakes and large, slow rivers in the Upper Midwest and

southern Canada, muskies are a cousin to northern pike that inhabit cool, clear water and are famously hard to catch. While muskie purists might argue the point, from an angling perspective, tiger muskies are virtually identical to pure-strain muskies.

Within this fish's native range, a small but obsessed pack of anglers regards muskies with the kind of awe accorded Pacific steelhead because of their mystique and the difficulty of catching one. Both steelhead and muskies are often referred to as "the fish of 10,000 casts."

Northerns, muskies, and tigers are similar in body shape and behavior, although only the tiger muskie has the distinct dark stripes running vertically across the body that give it its name. All three are elongated, powerfully built apex predators with long jaws studded by wickedly sharp teeth that many anglers have run afoul of while carelessly trying to remove a hook.

Like other ambush predators, tigers feed by waiting motionless behind subsurface logs or vegetation beds, where their side markings provide excellent camouflage. When a forage fish swims by, they strike with lightning speed, stun the prey with their bite, then swallow it head-first. They're

also notorious cannibals, sometimes dining on smaller members of their own species.

FIERCE BUT FINITE

Starting in 1987, FWP fisheries biologists added tigers to the state's pantheon of famous game fish, raising them at the Miles City Fish Hatchery and stocking them in Engstrom Pond and other locations.

Though FWP fisheries managers try to keep northern pike out of trout waters where the predators could harm salmonid populations, tiger muskies pose far less of a threat to other fisheries. Tigers stocked in Montana begin life in a hatchery and are shipped to rearing facilities here as fingerlings from



LAKE OF LUNKERS With beautiful views of the Little Belt and Snowy mountains, Ackley Lake is also surrounded by a popular 290-acre state park.

WHEN IS A WORLD RECORD NOT A STATE RECORD?

When Daniel Caricaburu-Lundin caught a 45.2-inch tiger muskie in 2024—a new IGFA world record for length—he quickly took photos and videos proving its size in inches, then released it. He estimated it was more than 30 pounds. State records, though, require a fish be officially weighed and the species verified by an FWP fisheries staff, so catch and release isn't an option.

Even if Caricaburu-Lundin had kept it, the fish likely would not have eclipsed Leo Cantin's state record tiger muskie caught in Deadman's Basin Reservoir on September 2, 2011. That fish measured 50 inches and weighed 38.75 pounds. But Cantin didn't enter his state record muskie to IGFA as a world record, either. IGFA also requires that an angler submit 16.5 feet of the main line used to catch the fish still attached to the double line and/or leader (if used), or if caught on fly tackle, the entire leader still attached to the fly.

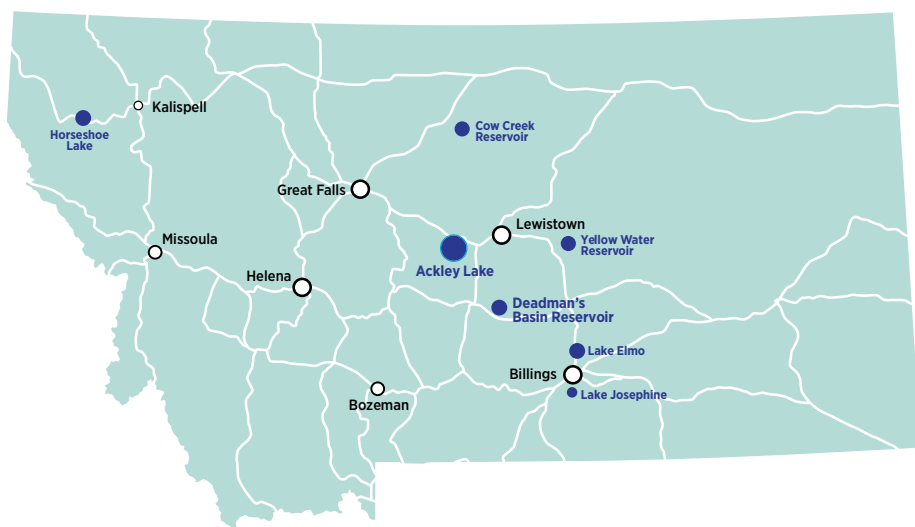
Outdoor writer E. Donnell Thomas, Jr. has written hundreds of articles and essays and more than a dozen books. He lives in Lewistown.



TIGER CUBS Stocked tiger muskies begin life in a hatchery before they are shipped to rearing facilities as fingerlings measuring 1 to 10 inches long.



COLOSSAL CATCH Mara Hofer of Stanford landed this 43.5-inch, 24-pound tiger muskie on Ackley Lake in 2022.



TIGER LAIRS Tiger muskies can be found across Montana not just in Ackley Lake near Hobson (though it has the most abundant population), but also in Deadman's Basin Reservoir, Lake Elmo, Cow Creek Reservoir, Yellow Water Reservoir, and other waters. In western Montana, they exist primarily in one location: Horseshoe Lake.

1 to 10 inches long. Like other hybrids, they grow more quickly than either of their parent species after release. In prime habitat with abundant forage fish, tigers can reach a weight of 10 to 20 pounds within five years, according to FWP biologist Clint Smith.

Muskies grow substantially larger than North American northern pike (European pike can reach similar sizes). Muskies can reach 67 pounds, while the largest pike taken in North America was just over 46. Tigers generally do not grow as large as either parent species, but are plenty big for most anglers. Any freshwater fish that approaches the 40-pound mark is a stupendous catch.

Though predator fish of such size could wreak havoc on populations of other fish species, tiger muskies have a built-in safety mechanism. Like some other crossbred species, they are sterile and can't reproduce. That means FWP fisheries managers can control numbers, placing only as many as they deem safe into any water.

Introduced predominantly in central Montana (see map), tigers are used by FWP biologists as a kind of surgical strike to accomplish a broader conservation goal.

"We place them primarily in reservoirs where we have overabundant populations of fish—mostly suckers, but also carp," Smith says. "The strategy is to try to

"We place them primarily in reservoirs where we have **overabundant populations of fish**—mostly suckers, but also carp."

convert some of that undesirable 'biomass' into a recreational resource, in this case tiger muskies. Anglers get excited about something unique and potentially huge to catch, but from FWP's perspective, the true emphasis is their role as a biocontrol—to eat the fish we'd like less of. That's why tigers generally need to be 40 inches long before you can harvest one. We want them in there doing the work to open up resources for trout and other game fish."



I caught a record-breaker! What now?

- To prevent loss of weight, do not clean or freeze the fish, but keep it cool, preferably on ice.
- Take a picture of the fish and measure its length and girth.
- Weigh the fish on a certified scale found in grocery stores, hardware stores, and some FWP offices. This must be witnessed by a store employee or other observer, and you'll need to obtain a weight receipt and an affidavit from store personnel if no FWP official is present.
- Contact the nearest FWP office to have the fish positively identified by a fisheries biologist.
- Fill out a State Fish Record Form.
- For IGFA world record requirements, visit: igfa.org/international-angling-rules.

FWP first put tigers in Ackley in 2015, and based on the growth rates he's seen, Smith wouldn't be surprised to see the state record topped in coming years. "They're only 10 years old at this point, but they can survive past 15. They've had the run of the place, and it's crazy how fast they grow."

In choosing locations to place tiger muskies, biologists pick impoundments containing few native game fish species. Outlet streams, if present, must either be physically obstructed or incapable of sustaining tigers, to prevent escapees from harming fish populations downstream. No plan works perfectly in the natural world, but as Smith points out, even if occasional tigers escape an impoundment, they won't be a problem for long, since the fish can't reproduce and eventually will die of old age.

HOOKING A TIGER

Similarities between northern pike and tiger muskies end when the angling starts. In the water and on the end of a line, tigers

take after purebred muskies. Pike are one of the easiest North American game fish to catch because they readily attack lures and have an inherent lack of caution. Muskies are far more finicky and are considered one of the most difficult freshwater fish to catch, especially on a fly.

When I set out to do just that, I knew I needed expert advice, so I turned to my friend Bob White.

Bob is a noted illustrator, and he and I have enjoyed a long friendship born of collaboration at numerous publications. He lives in east-central Minnesota in the heart of muskie country and has fished for them for decades. I was hoping I could apply his advice to tigers. He emphasized how muskie behavior can change depending on the location, weather, and time of day—in contrast to northerns, which will hit almost anything, anywhere, anytime. In the natural lakes and rivers that native muskies

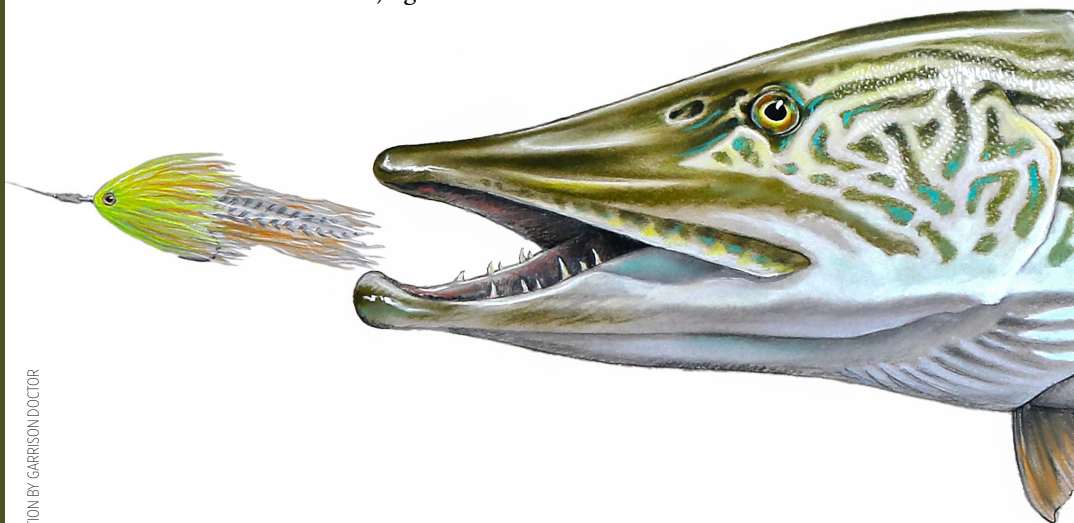


ILLUSTRATION BY GARRISON DOCTOR

LOADED FOR BARRACUDA

Tiger muskies like flashy lures that mimic their favored prey species, such as pikeminnow and suckers. Bucktail spinners, spinnerbaits, glide baits, jerk baits, and wooden or plastic plugs generally work well, and anglers also find success with large casting spoons.



inhabit, seasoned anglers concentrate on a few locations based on experience and local knowledge.

Bob also told me that muskie fishing is usually best in late summer and early fall—in other words, right now—when the fish are in shallow water 6 to 10 feet deep. They are especially active then as they feed aggressively in preparation for winter's lean times. In summer, they move to cooler water at depths up to 30 feet, making them harder to reach, especially with fly tackle.

For muskies, the bigger the fly, the better. I've had plenty of experience tying and casting large flies to saltwater species like tarpon and tuna, and he told me to tie patterns even bigger than those.

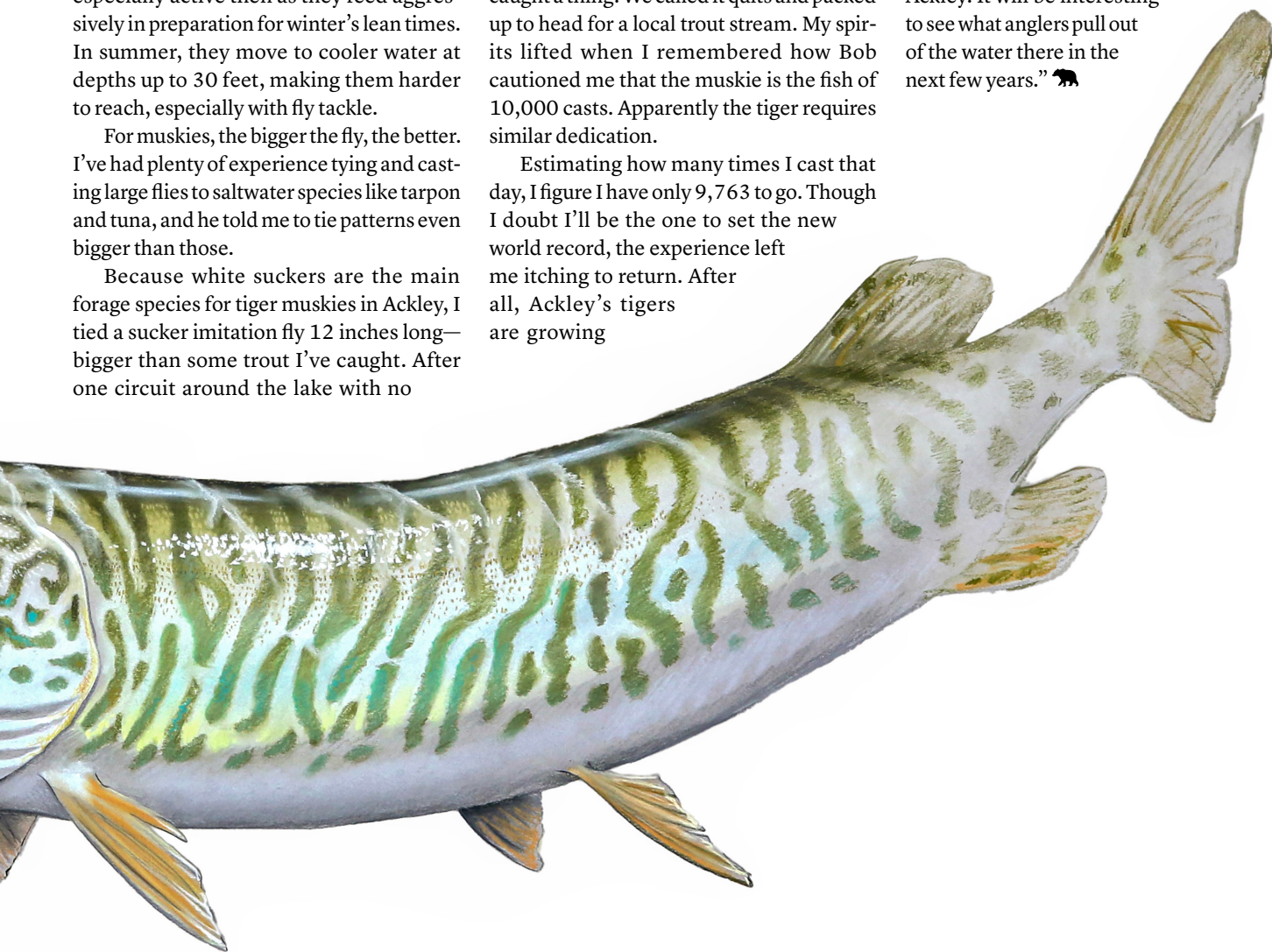
Because white suckers are the main forage species for tiger muskies in Ackley, I tied a sucker imitation fly 12 inches long—bigger than some trout I've caught. After one circuit around the lake with no

bites, Lori and I decided to cast from shore. Because the wind had come up, I switched to a smaller fly that would be easier to cast, though it was still bigger than almost anything I'd ever used before. Maybe I should have stuck with the foot-long fly, because after two hours of double-hauling, we hadn't caught a thing. We called it quits and packed up to head for a local trout stream. My spirits lifted when I remembered how Bob cautioned me that the muskie is the fish of 10,000 casts. Apparently the tiger requires similar dedication.

Estimating how many times I cast that day, I figure I have only 9,763 to go. Though I doubt I'll be the one to set the new world record, the experience left me itching to return. After all, Ackley's tigers are growing

bigger every day.

"As a biocontrol agent, we tend not to stock them too heavily, and with so much to eat, tigers shovel in the forage as fast as they can swim," says Smith. "That's one big reason we see monster fish in places like Ackley. It will be interesting to see what anglers pull out of the water there in the next few years." 🐻



Climbing for Dusky Grouse

By Noah Davis. Illustrations by Gary Palmer

In mid-September, when I climb to hunt dusky grouse, it's back through time.

The line between months blurs in the heat shimmers of the valley. Irrigated fields blink green below brittle, brown hills. Whitetails graze in their summer-red coats and muleys bed in the sage.

But as I travel from the river up a creek and follow the tumbling course higher, I ascend from cheatgrass and medusahead into bunchgrass and kinnikinnick. Up from brookies and browns into cutthroat. Up to where moose and elk spend hot days in the cool of elevation and north-facing slopes. Up to the dusky grouse—previously called blue grouse—where at 6,000 feet, I'm back in July. There are still ripe huckleberries.

This time is strange to climb into after an August of smoke and river hoot owl restrictions. Those huckleberries are a recent memory that arrives again like a dream. It's stranger still when I realize that in two weeks those same berries will take the first frost of fall while the valleys 3,000 feet below swelter for a month more.

Then the first snow arrives, a trigger to send the dusks even higher toward their arboreal winter homes where they'll wait for spring. At that time, I climb into the future (November disguised as January) to follow the grouse tracks stitching the white canvas along the seam of the ridgeline.

The only promise of a dusky mountain, the only sure footing in a place where seasons yo-yo, is the space to climb to the possibility of birds.

I park at a pull-off that leads to the northern ridge. The afternoon is too hot for elk hunters, so I have the mountain to myself and walk beneath a wide sky the shade of blue only September paints. The water bottle slides into my vest and number 6 shotshells click in a deep pocket as I stride out on the gated logging road. To my right, a garrison of lodgepole guards a spring seep. To my left, huckleberry leaves splash red toward ponderosas and the grassy parks above.

I take the first steep step off the two-track and start my scramble up.

The ruffed grouse woods of my Pennsylvania youth were thick and wet. I loved them. Springs slicked the rocky soil, aspen clones vibrated with sapling energy, laurel hells choked hillsides. Vision was measured in feet, not yards. It was a country with a romance for grouse hunting, where even if they were absent, one could hear a bell dangling from an English setter's neck and smell the sweet heat of pipe smoke.

I followed the seams of wild in those ridges and felt the need to climb. I believed that higher was where the ruffed grouse would be, farther from the valley where their covers were slashed and burned centuries ago. Farther from people and paved roads. There on the mountain was where the birds could be themselves.

Noah Davis is western conservation communications manager for the Theodore Roosevelt Conservation Partnership and a frequent contributor to an array of outdoor publications. His second book of poetry, The Last Beast We Revel In, was published by CavanKerry Press in April 2025.





Their natural, wary selves, in lowbush blueberry and beneath witch hazel, exploding in a flurry of wings and noise.

When I moved to the West, I found new, larger mountains, more ridges than I could ever hope to walk. There weren't only seams of wild to explore but entire ranges. Still, I did what I had always done: I climbed. And there at new heights, among new trees, I found a new grouse and fell into a new love.

I make the high ridge and bend to pick a few huckleberries that have softened and sag with sugary weight. I wash their sweetness down with water, leaving two gulps in the bottle to carry me back down the mountain.

Following the ridge's spine north, I keep to the lip of the eastern face. The light is honeyed with evening. Gray jays follow me, practicing for rifle season when they might trail some lucky hunter to an elk carcass. I try to let my eyes hunt more than my feet. My pace slows and my ears strain to hear the nervous putts of a grouse ready to flush.

The first dusky rises to my right and catches gravity to sail down the mountain. I bead the bird, but the distance is too great to pull the trigger. From behind, I hear a grouse in a huckleberry bush that lifts to my left and tries to make the same escape. My first barrel rocks the bird, and the second stops the flight.

I find the dusky lifeless, balanced between two clumps of beargrass. The silver breast obvious against the green. The cock bird is large, and I admire his heft in my hand. White feathers softer than cotton grass collar his neck. The patterns of the saddle melt into the color of a far ridge veiled in thin smoke.

Despite the diminishing light, I take the time to gut the grouse and inspect the crop. Beyond this being a mature bird, I have no idea the number of summers he'd lived. Even if this was only his second, he knew the time of plenty was coming to a close. The crop revealed a cornucopia of subalpine summer and fall: muddled huckleberries mixed with the exoskeletons of brown grasshoppers. I wipe my hands on my boots and slide the dusky next to my water bottle, which suddenly feels even emptier next to the warm weight.

The need to climb is something that pulls at my chest. Almost as if I were strapped into a harness tethered by a long rope to the highpoint of the ridge that I must reel in. I don't have a dog to help guide my wanderings, and so my bird hunting is based on habitat and hunches. Whenever I pause to contemplate my next move and wipe sweat from my face, the relentless answer to my questions is to gain elevation. Despite what my calves might suggest, despite the light slanting to a late hour. The birds are above. They're higher.

There are birds below the highest ridge. I've killed duskies when I've crawled up out of a creek bottom and met them in the copses of spent balsamroots just above the alders. But those aren't the birds I want to hunt. Those low birds are the ones that have heard the thump of an engine, who have seen the glint of discarded wrappers, who pick grit on the side of a well-used two-track. I'm looking, in some small way, to go back in time to a bird that does not need planted grain or shelter belts like pheasants and partridges. I want to go back to a bird that has been on the mountain before me and will be there, hopefully, long after.



I'm looking for the grouse that is able to live a grouse's life—as violent and short as it may be—which is wild and old. Hunting duskies means I can climb into that wild purity and hold it for a moment.

I keep working north, my mind's eye painting the eastern finger ridge ahead that will lead me back to the logging road, and the long, flat walk back to the car. But as I imagine that easy hiking, the slope before me pitches, and I crawl over blowdown, careful not to catch my pants on the sharp spines where branches have splintered off. I feel the chill of the evening on my sweat-soaked arms.

Nearly through the matchsticks, I spot a dusky not two pickup lengths in front of me on a downed lodgepole peering at my advance with confusion. My slow progress and grunting obviously not initially a threat, but now that eye contact has been made, the grouse flushes into a stand of timber.

I curse under my breath, knowing that a bird in a tree is never as easy as one on the wing. Once safely through the wood, I begin my routine of parsing apart the branches. I follow each green arm to the trunk, bob my head for different angles, sit down and stand up, change my position (always on the downhill side, knowing the bird will fly in that direction), and then surrender, convincing myself that the bird sailed farther than I thought. Evening's momentum is flowing toward dark.

As I step up to regain the ridge path, I catch movement on the edge of a branch. The grouse has come unstuck from the trunk and is preparing for flight. I swing as the dusky lifts and just as the bird falls with the slope of the mountain so does my barrel that crosses the blue shape.

I trace the line of feathers falling like the first snow. 🐾

Up and at 'em

By Tom Dickson

Hunting, fishing, or otherwise recreating outdoors this time of year requires getting up well before dawn. I love it.

Rising at 4 a.m. in late summer, I feel like I've got a jump on the world, two extra hours of the best time of day tucked in my back pocket.

Midweek, it's just me and the construction crews and other early workers out in the darkness. Occasionally I see another grouse hunter or trout angler and we give each other a nod. In the 1930s, the great outdoor writer Gordon MacQuarrie expressed that feeling of pre-dawn camaraderie as he left Milwaukee and headed to northern Wisconsin to hunt ducks and ruffed grouse: "On the highway I had eyes only for my own brethren of the varnished stock, the dead-grass skiff, the far-going boots. Cars with hunting-capped men and cars with dimly outlined retrievers in the back seats flashed by me."

After driving an hour I gas up and buy provisions at a convenience store, crowded with beefy guys in chartreuse T-shirts standing in line with their energy drinks and cinnamon rolls. A clerk asks one of the fellows in line, "How's that baby girl of yours, Trevor? She must be, what, three months old now?" The guy grins and holds up a picture on his phone.

The door chimes and a fellow comes in and asks to exchange his propane tank. The manager asks if he's still planning to smoke a brisket for the weekend. "Yep, and maybe some ribs for the in-laws coming from Spokane."

With shopping malls closed down and public parks littered with tents and tarps, it seems that convenience stores in early morning are about all we have left for community centers.

Outside at the pumps, the dawn light barely glows over the eastern horizon. As I wash my buggy windshield, a shiny pickup with Oklahoma plates drives in pulling an eight-door dog trailer and carrying four

guys, all laughing at something one of them did at the motel earlier that morning. I want to give them and all the other nonresident bird hunters the stink eye for vacuuming up all my birds with their hard-running English pointers and Weimaraners, but I remember when I first came to Montana to hunt from out of state. What goes around comes around.

Besides, that's not how I was raised. "How you guys doing?" I say. "Have a good hunt. Watch out for snakes and snares."

Now I'm out on the highway. Sunrise in central Montana this time of year is around 6:45 a.m., and I need to be well on my way by then to hit the water or grass while it's still cool enough for the trout to be active and the rattlesnakes sluggish. By 10 a.m. the fish will have stopped feeding but the snakes will be moving.

At noon this day it's too hot for me and my griffs to do anything but sit in the shade of a buffaloberry and pant. I share my sandwiches with them and we all take a nap.

On the drive home, I stop for sunflower seeds and a soda and to scrape grasshoppers off the windshield. A fishing guide drives in towing a boat dripping with water from the Missouri. He's on the phone talking to tomorrow's clients. I'd heard the fishing has been good recently, so maybe he's got a \$100 bill in his front shirt pocket from today's customers. Behind him a vacationing couple in their rental SUV pulls in, both looking a bit stunned to be in Montana and surrounded by so much space. They're smiling, too.

Everyone, residents and visitors alike, is happy to be out on the road this time of year.

Once home, I feed the dogs, make dinner for me and my wife, and am in bed by 9. I need my rest. It's September in Montana, and I've got another early day tomorrow. 🐾

Tom Dickson is the previous editor of Montana Outdoors.



ILLUSTRATION BY GARY PALMER

Plains prickly pear

Opuntia polyacantha By Lee Lamb

On June 14, 1805, after a day exploring the Great Falls of the Missouri, Meriwether Lewis wrote in his journal that he had been threatened not only by a grizzly bear, but also a “catlike” creature and a charging bison. He speculated that the day’s adventures might have been a dream, except that “the prickley pears which pierced my feet very severely once in awhile, particularly after it grew dark, convinced me that I was really awake.” If you’ve ever stalked a pronghorn antelope, your feet—and your hands and knees—will likely relate.

RANGE AND HABITAT

Meriwether Lewis and William Clark both mentioned plains prickly pears (*Opuntia polyacantha*, meaning “with many thorns”) frequently in their journals. Well adapted to a variety of environments and more cold tolerant than most other cacti, this hardy species is found across the western United States into northern Canada. Preferring dry, sandy soils at low to mid-elevations, plains prickly pears thrive in grasslands and sagebrush habitats. They are common across Montana’s plains, canyons, foothills, and lower mountains.

IDENTIFICATION

Aside from stepping on one, the best way to identify a plains prickly pear is by its segmented, flattened, bluish-green, 2- to 6-inch-long stems called *nopales* or “pads,” which are armed with clumps of needlelike spines that can grow up to 2 inches long. In Montana, the plant flowers in June and July, revealing showy, multi-petaled blossoms that measure 3 to 6 inches across. The flowers change color over the course of the bloom from yellow to red or reddish-purple, an adaptation that increases the chances a plant will be pollinated by attracting different types of pollinators. The pear-shaped, reddish fruit, called *tunas*, measure about

an inch long and are covered with spines. Plains prickly pears grow in rounded clumps that range from 4 to 12 inches tall and often spread into mats that can stretch 10 feet across.

REPRODUCTION

This cactus reproduces both by seed and by resprouting. Seeds are dispersed when a tuna falls to the ground, is eaten by an animal and later passed through the digestive system, or sticks to an animal’s fur and is transported to a new location. Resprouting occurs when a pad becomes detached from a plant by wind, hail, animals, or vehicles, takes root where it lands, and develops into a new plant.

ADAPTATIONS

Plains prickly pears are a succulent remarkably adapted to arid environments. They have shallow roots to grab whatever paltry precipitation is offered, then rely on thick, fleshy pads covered in waxy skin to retain that water through heat and drought. Like most cacti, their leaves are microscopic or drop off shortly after sprouting, so the pads take on the task of photosynthesis, converting sunlight, water, and carbon dioxide to oxygen and food in the form of glucose.

Each pad is covered with small, bud-like structures called *areoles* from which cacti flowers, new stems, and spines grow. The spines, which are modified leaves that help deter most animals from eating the cactus, also provide the plant with shade and protection from wind to help preserve moisture.

Spines can be quite painful if they become lodged in your skin. Adding insult to injury, areoles also sprout tufts of tiny, barbed hairs called *glochids* that easily detach and penetrate the skin. Glochids are difficult to see and remove, and can cause considerable itching, swelling, burning, and stinging. It’s no wonder Meriwether Lewis declared the plains prickly pear “the greatest pest of the plains.”



BRISTLES AND GRIT Built for frigid cold and searing heat, plains prickly pears thrive in environments most cacti can’t handle.

USES

Native Americans have long used plains prickly pears as a source of food and medicine. Tunas are eaten raw, cooked, or dried, the spines removed by burning them off or sweeping the fruit with sagebrush branches. The juice can be used to waterproof painted rawhide. A poultice made from the inner flesh of the pad can treat skin sores, infections, wounds, and backaches. The pad also supplies a sticky gum used as an adhesive and as a mordant in fixing dyes.

Food and drinks derived from the fruits, juice, pads, and flowers of the plains prickly pear continue to be popular, especially in the American Southwest and northern Mexico. In Montana, tunas are eaten raw or used in jams, jellies, and candy.

ECOLOGICAL SIGNIFICANCE

Bees, moths, and birds rely on nectar from prickly pear cactus flowers, and ground squirrels, rabbits, and packrats eat the inner flesh of pads and fruit. Pronghorn, deer, and other animals will also feed on plains prickly pears after a fire has swept through an area and singed off the thorns and glochids. 🐘

Lee Lamb is a freelance writer in Missoula, Montana.



THE **OUTSIDE** IS IN US ALL.



Whether you're fishing, camping, skiing, mountain biking, boating, hiking, wildlife watching, or **bowhunting the high country**, Montana is a place where everyone can find their own way to connect with the natural world. Around here, **the outside is in us all.** PHOTO BY JACKSON BLAND



Montana Outdoors

Online: fwp.mt.gov/montana-outdoors

Subscriptions: 800-678-6668

 Find us on Facebook [Montana Outdoors Magazine](#)



MONTANA OUTDOORS

\$4.50



7 25274 88810 8

0 9 >